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OCCUPATIONS

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A.G.C.T. SCORES OF ARMY PERSONNEL GROUPED BY OCCUPATION
NAOMI STEWART

U.S.E.S. GENERAL APTITUDE TEST BATTERY
BEATRICE J. DVORAK

SCIENTIFIC MANAGEMENT AND HUMAN RESOURCES
LILLIAN M. GILBRETH

THE AMERICAN COUNCIL ON EDUCATION AND STUDENT PERSONNEL WORK
A. J. BRUMBAUGH

CONVENTION REPORTS

WASHINGTON FLASHES

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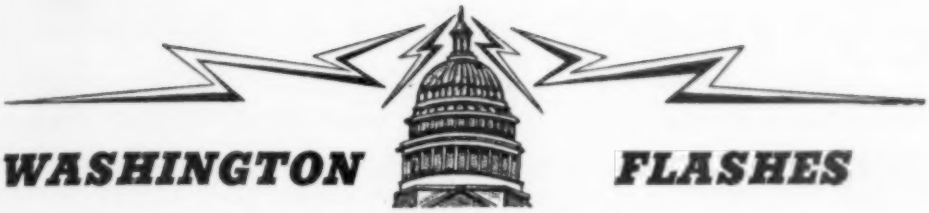

Transmitted by Max F. Baer

LABOR DEPARTMENT: AFTER THE STORM

Congress on rampage: Labor Department has been badly hurt by Congressional economy stampede. Staff has been slashed by one-third. Things would have been worse if Senate had not restored some of cuts ordered by House. One House member wanted to know why money should be spent on Dictionary of Occupational Titles, why Webster's Dictionary isn't good enough. U. S. Employment Service has lost 754 employees; Bureau of Labor Statistics had to drop 631 people; Veterans Employment Service has 312 fewer staff members; Wage and Hour Division lost 270.

Occupational Outlook carries on: Occupational Outlook Division lost 15 out of 45 employees. This means that fewer outlook studies will be completed in any year. Full impact of retrenchment won't be felt until next year, since number of studies are well under way as result of efforts of old staff. In preparation are studies on printing, hotel occupations, railroads, engineering, pharmacy, electric light and power. Occupational Outlook has whipped up for President's Commission on Higher Education summaries of employment prospects in some 30 major professions. Don't look for this till end of year.

USES reorganization: Overhauled USES now consists of five divisions: (1) Program Policy (including Counseling, Testing, and Selective Placement Branch, Staff Training Branch, and Minority Groups Consultation); (2) Technical Service (including Occupational Analysis Branch and Reports and Analysis Branch); (3) Field Service; (4) Farm Placement; (5) Business Administration. USES hasn't given up major goals or projects. But it will take much longer to get things done. New strategy is to look to states for much research that was up to now done from Washington. Big headache is not only cut in number of workers, but fact that experienced personnel without permanent status had to be discharged in favor of inexperienced people with status.

Occupational Analysis continues: Staff here was cut from 150 to 41. But 11 of these are in testing and went over to Program Policy Division. What's left of staff is concentrating on getting out revised edition of Dictionary. Under normal conditions, revision would have gone to printer this summer. As things are, many months of work lie ahead while reduced staff is trained in work. Only one or two persons will be able to work on further de-

Education (stacks)

velopment of Part IV of Dictionary. Most of research on job rel tionships will have to wait. Preparation of job descriptions wi go on.

Reports and Analysis limits goals: Staff was cut from 136 to 56. Instead of issuing statements on about 20 industries eac month as in past, branch won't be able to issue more than five o six such statements. Area statements will cover about 20 instea of 140 areas as in good old days. But 26 Occupational Guides ar now being printed and a few more will be turned out each month i future. Occupational Guides consist of labor market information prepared by Reports and Analysis branch and job descriptions pre- pared by Occupational Analysis branch (see WASHINGTON FLASHES, April, 1947).

Counseling and testing not affected: There's no change in number of people assigned to counseling and testing program. Mo stress may be put on both activities.

SCIENCE FOUNDATION STILL IN CARDS

Truman veto not fatal: President vetoed bill passed by 80 Congress for establishment of National Science Foundation. He attacked administrative set-up worked out by Congress, not heart of bill. Therefore, you can expect new bill to be passed when Congress goes back to work in January. Only administrative changes may be made in new bill.

Scholarship program: Vetoed bill authorized Foundation to grant scholarships and graduate fellowships in mathematical, physical, medical, biological, engineering, and other sciences. Other sciences would be decided by Foundation's Division of Scientific Personnel and Education. Scholarship and fellowship winners would be picked solely on basis of ability, though effor would be made to give awards to young people in all parts of country. Winners would be able to study at accredited non-profi American or foreign schools of their own choice. Bill also pro- vided that now-defunct National Roster of Scientific and Specialized Personnel would become part of National Science Foundation.

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The Vocational Guidance Journal

Vocational guidance is the process of assisting the individual to choose an occupation, prepare for, enter upon, and progress in it.

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A.G.C.T. Scores of Army Personnel Grouped by Occupation

NAOMI STEWART[1]

Cooperative Test Service of the American Council on Education

Introduction

When the report of the contributions made by psychologists in World War I was published (see Psychological Examining in the U. S. Army, edited by R. M. Yerkes, Memoirs of the National Academy of Sciences. Washington, 1921), the data that received most attention from persons interested in vocational adjustment were the scores made on the Army Alpha test by Army personnel grouped according to the occupations which they followed in civilian life. The number of men involved was only 18,423 and the occupational groups numbered only 68; nevertheless, the data constituted the largest sampling available and they markedly affected the practice and theory of vocational guidance and vocational selection.

Because of the continuing interest in data of this sort, the publishers of OCCUPATIONS *take pride in presenting to their readers the present study by Naomi Stewart, based on a much larger mass of statistics gathered in World War II. We are confident that they will be welcomed in this unabridged form.*

We are indebted to the Adjutant General's Office of the War Department for making this material available. It is anticipated that a considerable demand for extra copies will arise. Orders (at $0.60 each) should be placed early, for the supply is limited.—THE EDITORS

THIS PAPER gives a detailed report of a study of the relationship between civilian occupation and Army General Classification Test standard score, based on Army data. It gives results for 81,553 white enlisted men in 227 different occupations. The study in its entirety required the processing and analysis of various kinds of data for more than 250,000 cases. Data for 222 additional occupations were also obtained, but these results are not given because the number of cases in these occupations was too small to yield reliable information.

The study had its inception in a recommendation made by Walter V. Bingham, Chief Psychologist of the Classification and Replacement Branch, A.G.O., and Chairman of the Committee on Classification of Military Personnel Advisory to The Adjutant General. During the eleventh meeting of the Committee, in May, 1944, Dr. Bingham proposed that the relationship between Civilian Occupational Specialty and Army General Classification Test score be investigated, both for its historic importance and for the value the results would have in separation counseling in the Army and later in civilian counseling.

This recommendation became official, and Marion W. Richardson, Lt. Col., A.G.D., Chief of Personnel Research, A.G.O., directed the Personnel Research Section to proceed with the study. The data were analyzed by the writer and results reported in Personnel Research Section Study No. 675 (5), upon which the present paper is based in part.

[1] This material comes in part rom data which the writer analyzed while employed by the Personnel Research Section of the Adjutant General's Office. For a presentation of the mission of the Personnel Research Section, see (3). The work was done under the direction of Edward A. Rundquist and Reign H. Bittner, who both furnished valuable suggestions and constructive criticism. Helpful suggestions were also made by E. Donald Sisson and Erwin K. Taylor. Walter V. Bingham, most responsible for initiating the study, was also kind enough to read the present manuscript in rough draft and to propose many improvements. The writer's indebtedness to the individuals mentioned is here gratefully acknowledged.

Population and Variables

The basic data for this study were obtained from the War Department Machine Records Survey No. 2, taken March 30, 1944, and from the War Department Machine Records Survey No. 3, taken June 30, 1944. War Department Machine Records Surveys were taken every three months. Each Survey yielded data for approximately 2 per cent of all Army personnel, including enlisted men, officers, WAC's and nurses—or roughly 150,000 individuals—on such variables as year of birth, marital status, number of direct dependents, race, years of education, Arm or Service, main civilian occupation, number of years at main civilian occupation, average weekly wage at main civilian occupation, Army General Classification Test Score (for enlisted personnel only), military occupational specialty, Service Command of residence at time of induction, etc.

The kind of data sought varied somewhat from one Survey to another, as did the manner in which the variables were coded and punched by the Machine Records Units. In Survey 2 data of the kind enumerated above were given for all Army personnel whose serial numbers ended in either 17 or 73; in Survey 3, for all personnel whose serial numbers ended in either 18 or 74.

Inasmuch as no Army General Classification Test scores were available for officers, the study described here was confined to enlisted personnel. Inclusion in the study of all enlisted personnel was at first planned, with a control on race and sex to yield results which could be interpreted unambiguously, but since the number of enlisted women and of non-white enlisted personnel was too small to afford sufficient cases for study in most of the occupations, it was decided to limit the investigation to data for white enlisted men. There were 91,624 white enlisted men in Survey 2, and 88,907 in Survey 3 for whom Army General Classification Test scores were available. The Survey 2 data were used primarily for methodological refinement of procedures, which were then carried out on the Survey 3 data.

In both Survey 2 and Survey 3, data were given which represented an individual's main civilian occupation prior to entering the Army (also called civilian occupational specialty), but in Survey 2 civilian occupation was punched in terms of the 6-digit United States Employment Service code given in the *Dictionary of Occupational Titles*, whereas in Survey 3 it was punched in terms of the 3-digit Specification Serial Number code given in the War Department Technical Manual 12-426. The fact that the latter code was far easier to work with than the former made it almost mandatory to use the Survey 3 data for the major investigation, although the Survey 2 data were very useful for primary analysis.

The Army General Classification Test, routinely administered to all inductees, was designed to measure their "aptness" for service. While the term "intelligence test" has never been officially applied to the AGCT, it has been found to correlate almost as high with various tests so designated as their own reliability coefficients.

Army General Classification Test results were reported in terms of Army standard scores which had a mean of 100 and a standard deviation of 20 for the standardization population (4).

Preliminary Methodological Investigation

An examination of the data showed punching errors in both Surveys which produced impossible AGCT scores, USES or SSN codes which did not exist, age values below 18, etc. Cards in which obvious errors in coding AGCT score or occupation had occurred could be eliminated upon inspection, but to what extent could AGCT score and occupation code be trusted for cards where obvious errors in coding age or years of education or wage appeared? And for the cases where occupation had clearly been coded incorrectly, had factors related to AGCT score entered into failure to code correctly, or had miscoding occurred on a purely random basis? And what about cards which, while not obviously in error with respect to one or another of the variables under consideration, gave wage figures, or years of education figures which seemed suspiciously high or low for the occupation in question?

Since it was impossible to check each sus

pected datum individually, it was necessary to examine possible criteria for rejection of cases and to determine the value of each empirically. An additional problem involved was to decide what, if any, minimum number of years of experience within each occupation should be set as a criterion of occupational group membership.

Part of this preliminary investigation was conducted upon data from Survey 2; the remainder upon data from Survey 3. This came about partially because Survey 2 data were available for analysis three months before the Survey 3 data; partially because the nature of coding differences in the two Surveys made it more economical to utilize certain variables from each, rather than all variables from one or the other, for the preliminary investigation. As has already been indicated, the use of the 3-digit occupational code in Survey 3 made that Survey the optimal source of data for the final determination of AGCT levels of various occupations.

An intensive study was then made of nine occupations in Survey 2, which required the sorting of more than 100,000 cards to isolate the 15,835 cards for white enlisted men in these nine occupations. Separately for each occupation, the following possible criteria of rejection were investigated to determine their effect upon the AGCT distributions of the residual, non-rejected cases: age less than 18 or more than 50; years of education plus years of experience plus five, greater than the age of the individual; wage improbably high or low for the occupation concerned; years of education improbably high for the occupation concerned.

The results indicated that, in the main, an inappreciable number of cases in each occupation were affected, and that none of these criteria of rejection appeared to be worth following in the major study.

In order to determine whether any factors related to AGCT score were involved in failure to code certain cards properly with respect to main civilian occupation as defined by the 3-digit Specification Serial Number code, we obtained the AGCT standard score distribution for all cards in Survey 3 with indecipherable codes (5,226) and for all cards (1,063) with impossible codes (although apparently bona fide, they corresponded to no codes ever used in the Army). The 10th, 25th, 50th, 75th, and 90th percentiles for these two distributions were computed and compared with the corresponding values for the AGCT distribution for all white enlisted men in Survey 2. The corresponding percentile points for all three distributions were very similar, which indicated strongly that no factors related to AGCT score entered into the failure to code certain cards properly with respect to main civilian occupation in Survey 3.

To determine the influence of number of years of experience within each occupation upon the AGCT distribution for that occupation, AGCT frequency and cumulative frequency distributions were obtained for every occupation defined by a bona fide occupational code in Survey 3, according to the following groupings of years of experience: all years, 1 year or more, 2 years or more, 3 years or more. Medians for each distribution were computed for all occupations in which the group with 3 or more years of experience contained at least 25 cases.

There were 179 occupations which met this requirement. Of these, only 35 showed absolute differences of as much as 3 score points or more in median AGCT standard score between the total group and the group with 3 or more years of experience. Further, in about two-thirds of these 35 occupations, the latter group contained less than 50 cases, suggesting that the difference might well have been accounted for by sampling errors. Some of the differences among the remaining occupations probably represent a real relationship of AGCT median to length of experience within the occupation; however, the relatively small number of such differences indicated that the final results would not be much affected by the inclusion of all cases, regardless of number of years of experience.

This conclusion was further strengthened by the near-perfect relationship between the AGCT median rank order of the occupations based on the total group within each occupation and that based on cases with 3 or more years of experience. The correlation was .97.

In light of the slight relative differences and the small absolute differences, it was decided

to ignore number of years of experience in the major investigation. This, however, in no way implies that there is no relationship between number of years of experience and AGCT score with some occupations. A different type of analysis is necessary to bring out such relationship as may exist.

Major Investigation

Of the 89,907 white enlisted men in Survey 3 for whom AGCT scores were available, 6,289 had been eliminated, as already described, because of indecipherable and impossible occupational codes. For the remaining 83,618 white enlisted men, AGCT frequency and cumulative frequency distributions were obtained for every occupation defined by a bona fide code according to the following geographical breakdown on Service Command of residence at time of induction: "North"[2]—1st, 2nd, 3rd, 5th, 6th, 7th, and 9th Service Commands; "South"[2]—4th and 8th Service Commands; Unknown—Service Command of residence not punched; and Total—including "North," "South," and Unknown.

For every distribution which contained at least 50 cases, the 10th, 25th, 50th, 75th, and 90th percentiles and the semi-interquartile range were computed; for every distribution which contained less than 50 but at least 25 cases, the 50th percentile was computed. The results were arranged in descending order of AGCT median for the total group in each occupation, but were not considered final until one additional check had been made.

Although, as already described, the 6,289 cards with indecipherable and impossible occupational codes had been eliminated, the possibility still remained that other, less obvious errors had occurred when the Machine Records Units had coded some of the remaining 83,618 cards. There was, of course, no way to catch all of these, if they existed. It seemed highly advisable to scrutinize with particular care the AGCT medians for all occupations containing less than 50 cases whose codes were sufficiently similar to codes for other occupations, more strongly represented in the sample, to indicate the possibility that some or all of the former might be incorrectly coded cards belonging to the latter groups. If the medians indicated that such miscoding apparently did occur, the results for these occupations were to be removed from the final table.

This check was made and three such occupations found: continuity writer, geographer and control supervisor. The medians for these occupations (whose codes were, respectively, 490, 306, and 493) indicated that they had been very strongly contaminated with incorrectly coded laborers (code 590), farm workers (499), hospital orderlies (303), and hoist operators (360). Consequently data for these occupations were discarded. Results for the remaining 227 occupations represented by at least 25 cases in Survey 3 are given in Table I. Some of these however, may still be contaminated by punching errors.

AGCT Occupational Hierarchy

For ease in interpretation, some of the data given in Table I have been presented graphically in Figure 1 for all occupations where the total number was at least 50. In Figure 1 the existence of an AGCT occupational hierarchy is clearly illustrated, as is also the fact that it is not an equally scaled hierarchy. Inspection reveals that differences in medians between proximate occupations are much larger at the extremes of the range than they are in the middle section. There are many more occupations with medians in the middle of the range than with medians at the extremes. The same is also true for differences between proximate groups with respect to the other percentile points that have been computed.

The non-linear character of the obtained hierarchy and the lack of equal spacing may be clearly brought into focus by cutting the total distribution of obtained medians into half-sigma intervals and observing how many occupations fall in each interval. This has been done in Table II.

As may be seen from Table II, no occupations have median AGCT scores for the total group which are more than 2.5 sigmas above the mean for all the medians, and no occupa-

(Continued on Page 20)

[2] "North" and "South" are labels used primarily for ease of reference. States included under "South," in what were at that time the 4th and 8th Service Commands, are: North and South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Louisiana, Arkansas, Oklahoma, Texas, and New Mexico. The remaining states, all included under "North," comprise the eastern, north central, northwestern, and southwestern parts of the country.

TABLE I (For Index, see Page 39.)

SELECTED PERCENTILE POINTS FOR AGCT DISTRIBUTIONS OF NORTHERN AND SOUTHERN WHITE ENLISTED MEN IN CIVILIAN OCCUPATIONS CODED AS IN TM 12-426, ARRANGED IN DESCENDING ORDER OF AGCT MEDIAN FOR THE TOTAL GROUP

Data from Machine Records Survey 3, June, 1944

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
1	268 Accountant	N	173	117	123	130	137	144	7.0
		S	37			124			
		T**	216	114	121	129	136	143	7.5
2	224 Student, Mechanical Engineering	N	47			128			
		T	62	114	122	128	135	140	6.5
3	368 Personnel Clerk	N	31			128			
		T	33			128			
4	122 Student, Medicine	N	97	116	123	128	136	141	6.5
		S	25			124			
		T	124	116	120	127	135	140	7.5
5	292 Chemist	N	33			128			
		T	40			127			
6	223 Student, Electrical Engineering	N	29			127			
		T	36			127			
7	274 Writer	N	46			127			
		T	54	114	123	126	133	140	5.0
8	222 Student, Civil Engineering	N	32			126			
		T	39			126			
9	212 Statistical Clerk	N	63	114	119	126	135	142	8.0
		T	72	114	119	125	133	141	7.0
10	221 Student, Chemical Engineering	N	58	108	118	125	135	144	8.5
		T	73	105	117	125	134	142	8.5
11	327 Teacher	N	278	111	119	126	134	140	7.5
		S	69	103	113	121	129	142	8.0
		T	360	110	117	124	132	140	7.5
12	279 Lawyer	N	138	112	118	125	133	141	7.5
		T	164	112	118	124	132	141	7.0
13	336 Student, Business or Public Administration	N	116	111	118	125	130	140	6.0
		T	152	114	118	124	131	140	6.5
14	390 Auditor	N	77	98	115	124	134	146	9.5
		T	89	88	112	124	132	145	10.0
15	066 Student, Dentistry	N	29			124			
		T	31			124			
16	350 Bookkeeper, General	N	221	108	115	124	129	139	7.0
		S	67	105	112	119	127	134	7.5
		T	302	108	114	122	129	138	7.5
17	052 Chief Clerk	N	231	108	115	123	133	142	9.0
		S	57	102	110	120	128	139	9.0
		T	297	107	114	122	131	141	8.5
18	213 Stenographer	N	172	110	115	122	130	139	7.5
		S	29			119			
		T	206	109	115	122	130	139	7.5
19	149 Pharmacist	N	64	101	114	121	128	135	7.0
		T	78	103	112	121	129	135	8.5
20	247 Typist—obs.†	N	63	102	112	119	128	139	8.0
		T	75	102	112	121	128	139	8.0
21	070 Draftsman	N	123	99	108	120	127	135	9.5
		T	139	99	109	120	127	137	9.0
22	411 Chemical Laboratory Assistant	N	119	99	109	120	127	139	9.0
		T	134	97	109	120	127	138	9.0
23	071 Draftsman, Mechanical	N	91	105	110	120	128	135	9.0
		T	99	105	111	120	128	135	8.5

* R—Residence at time of induction. Service Commands grouped as follows: N—North (1st, 2nd, 3rd, 5th, 6th, 7th, 9th). S—South (4th, 8th). U—Unknown. T—Total. ** The total number of cases in each occupation is greater than the number in the Northern and Southern groups combined because cases whose Service Command of residence is unkown are included in the total. † *Obs.*—indicates occupational codes which had become obsolete by June 30, 1944.

TABLE I (*Continued*)

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
24	301	N	56	98	110	120	124	129
	Investigator	T	72	99	114	120	124	132
25	399	N	62	105	113	120	127	134
	Reporter	T	70	104	113	120	128	136
26	300	T	29			120		
	Tool Designer—obs.							
27	400	N	54	102	110	119	128	141
	Tabulating Machine Operator	T	61	102	111	120	127	134
28	105	N	67	99	108	121	128	137
	Addressing-Embossing Machine Operator	T	78	99	109	119	127	132
29	379	N	32			120		
	Traffic Rate Clerk	T	42			119		
30	405	N	503	100	110	119	125	133
	Clerk-Typist	S	94	102	111	119	127	133
		T	616	101	110	119	126	134
31	056	N	319	99	109	119	127	136
	Postal Clerk	S	43			117		
		T	377	100	109	119	126	136
32	351	N	37			119		
	Bookkeeping Machine Operator	T	56	97	108	118	128	140
33	120	N	32			118		
	Meat or Dairy Inspector	T	37			118		
34	154	N	33			118		
	Photographic Laboratory Technician	T	36			118		
35	237	T	29			118		
	Teletype Operator							
36	395	T	28			118		
	Student, Sociology							
37	231	N	29			120		
	Switchboard Installer, Telephone and Telegraph, Dial	T	34			117		
38	269	N	122	94	108	119	128	134
	Cashier	S	38			116		
		T	168	91	107	117	127	134
39	323	N	90	98	109	119	126	133
	Stock Record Clerk	T	114	91	107	117	125	131
40	055	N	1,645	98	109	118	126	133
	Clerk, General	S	342	95	106	115	124	133
		U	76	96	105	114	124	131
		T	2,063	97	108	117	125	133
41	174	N	162	100	109	117	125	136
	Radio Repairman	S	32			114		
		T	198	97	108	117	125	136
42	371	N	153	89	104	117	126	136
	Purchasing Agent	S	41			114		
		T	197	88	104	117	125	134
43	228	N	34			117		
	Survey and Instrument Man	T	51	91	102	117	123	130
44	160	T	26			117		
	Physics Laboratory Assistant							
45	374	N	125	95	106	116	124	133
	Stock Control Clerk	T	152	95	107	117	124	133
46	369	N	81	99	110	116	121	129
	Manager, Production	T	94	99	111	117	124	129
47	031	N	65	93	102	119	127	137
	Boilermaker, Layer-Out—obs.	T	88	76	99	116	125	137
48	177	T	31			116		
	Radio Operator							
49	106	N	33			115		
	Linotype Operator	T	43			116		

TABLE I (*Continued*)

Rank	Specification Serial Number and Name	R*	No.	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
50	397	N	54	93	105	118	126	130	10.5
	Student, Mechanics—obs.	T	66	93	105	115	122	128	8.5
51	321	N	667	97	108	117	126	134	9.0
	Salesman	S	169	83	99	110	120	129	10.5
		T	859	94	107	115	125	133	9.0
52	283	N	55	91	103	117	130	135	13.5
	Athletic Instructor	T	73	93	104	115	125	133	10.5
53	352	N	293	94	108	116	124	133	8.0
	Store Manager	S	72	82	95	108	117	128	11.0
		T	385	91	104	115	124	133	10.0
54	097	N	48			115			
	Installer-Repairman, Telephone and Telegraph	T	62	98	108	115	120	133	6.0
55	138	N	39			115			
	Motorcycle Mechanic	T	46			115			
56	266	T	25			115			
	Dispatcher Clerk, Crew								
57	026	N	38			114			
	Tool Dresser	T	49			115			
58	355	N	107	98	108	115	123	130	7.5
	File Clerk	T	119	96	105	114	123	129	9.0
59	079	N	37			115			
	Embalmer	T	55	98	105	114	119	130	7.0
60	005	N	92	91	101	114	127	133	13.0
	Brake Inspector, Railway	S	34			115			
		T	130	90	102	114	127	133	12.5
61	008	N	74	94	105	114	123	130	9.0
	Airplane and Engine Mechanic	S	34			112			
		T	115	92	102	114	123	130	10.5
62	457	N	83	93	104	114	124	133	10.0
	Shop Clerk	T	89	93	104	114	124	133	10.0
63	296	N	74	93	107	114	121	127	7.0
	Artist	T	82	96	106	114	121	127	7.5
64	020	N	67	93	99	114	125	132	13.0
	Band Leader	T	82	92	99	114	124	129	12.5
65	152	N	61	88	110	114	124	131	7.0
	Photographer	T	70	88	109	114	124	129	7.5
66	099	N	52	96	105	114	126	133	10.5
	Geologist	T	62	93	105	114	124	131	9.5
67	404	N	44			114			
	Airplane Engine Service Mechanic—obs.	T	52	99	105	114	119	131	7.0
68	039	N	34			114			
	Cable Splicer, Telephone and Telegraph	T	43			114			
69	227	N	30			114			
	Surveyor	T	42			114			
70	480	N	2,060	94	104	114	123	130	9.5
	Student, High School, Academic	S	469	83	95	108	119	127	12.0
		U	79	89	103	110	116	126	6.5
		T	2,608	92	102	113	122	129	10.0
71	028	N	58	90	97	112	125	131	14.0
	Blueprinter or Photostat Operator	T	67	91	100	113	125	134	12.5
72	035	N	62	90	100	115	125	133	12.5
	Carpenter, Heavy Construction	T	82	87	97	112	124	132	13.5
73	410	N	55	85	95	115	126	131	15.5
	Dispatcher, Motor Vehicle	T	71	82	93	112	124	131	15.5
74	011	N	49			114			
	Gunsmith	T	53	88	100	112	119	123	9.5
75	021	N	134	88	102	113	120	129	9.0
	Musician, Instrumental	T	161	90	103	112	120	129	8.5
76	241	N	138	92	101	112	123	129	11.0
	Tool Maker	T	147	92	101	112	123	129	11.0

TABLE I (*Continued*)

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
77	123 Nurse, Practical	N	29			112		
		T	35			112		
78	155 Photographer, Portrait	T	28			112		
79	107 Photolithographer	T	26			112		
80	191 Rodman and Chainman, Surveying	N	73	92	102	117	124	129
		S	38			102		
		T	117	87	97	111	120	127
81	007 Airplane Fabric and Dope Worker	N	33			115		
		T	43			111		
82	128 Multilith or Multigraph Operator	N	47			114		
		T	54	98	105	111	120	130
83	195 Shipping Clerk	N	336	90	102	112	122	129
		S	59	77	91	103	114	126
		T	408	89	101	111	121	128
84	168 Printer	N	166	89	99	112	121	129
		T	192	89	99	111	120	129
85	124 Steward	N	51	83	97	112	120	125
		T	68	73	95	111	119	125
86	252 Foreman, Warehouse	N	112	80	100	111	120	130
		T	138	80	101	111	121	129
87	433 Bandsman, Cornet or Trumpet	N	30			111		
		T	33			111		
88	098 Instrument Repairman, Nonelectrical	N	32			110		
		T	37			111		
89	032 Boring Mill Operator—obs.	N	123	86	96	108	120	128
		T	150	86	98	111	120	129
90	137 Projectionist, Motion Picture	N	71	92	104	113	124	131
		S	33			106		
		T	111	87	100	110	122	129
91	067 Dental Laboratory Technician	N	53	77	91	112	121	127
		T	69	79	94	110	121	127
92	016 Laboratory Technician, V-mail or Microfilm	N	45			112		
		T	52	81	100	110	119	129
93	086 Foreman, Machine Shop	N	43			112		
		T	48			110		
94	324 Stock Clerk	N	660	86	99	111	120	128
		S	100	72	91	104	113	121
		U	31			109		
		T	791	85	99	110	120	127
95	145 Painter, Sign	N	77	83	98	111	119	127
		T	96	83	98	110	117	126
96	114 Machinist	N	540	87	99	110	120	127
		S	48			108		
		U	29			109		
		T	617	86	99	110	120	127
97	001 Photographer, Aerial	N	488	83	99	110	119	128
		S	109	74	93	108	117	123
		T	603	83	98	110	119	128
98	101 Engine Lathe Operator—obs.	N	263	89	101	110	120	128
		T	283	89	101	110	120	128
99	348 Parts Clerk, Automotive	N	98	93	98	110	120	128
		S	34			107		
		T	133	90	98	110	119	127
100	062 Cook's Helper	N	53	80	90	110	120	131
		T	62	78	89	110	122	132
101	180 Railway Mechanic, General—obs.	N	52	88	101	110	119	131
		T	61	88	98	110	119	131
102	282 Office Machine Serviceman	N	40			110		
		T	51	89	99	110	119	128

TABLE I (*Continued*)

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
103	481	N	243	90	99	109	117	125	9.0
	Student, High School, Commercial	T	275	90	99	110	118	124	9.5
104	295	N	30			109			
	Electrician, Airplane	T	35			110			
105	396	N	51	93	100	112	125	132	12.5
	Student, Manual Arts—obs.	T	60	87	99	109	121	132	11.0
106	291	N	127	88	100	111	119	129	9.5
	Policeman	S	40			98			
		T	172	86	96	109	118	128	11.0
107	373	N	1,767	85	98	110	120	129	11.0
	Sales Clerk	S	506	77	89	102	114	123	12.5
		U	89	86	99	109	119	128	10.0
		T	2,362	82	95	109	119	128	12.0
108	078	N	334	81	98	110	118	125	10.0
	Electrician	S	76	83	91	105	115	124	12.0
		U	25			105			
		T	435	83	96	109	118	124	11.0
109	238	N	73	80	99	110	121	132	11.0
	Lineman, Telephone and Telegraph	T	96	79	97	109	120	129	11.5
110	381	N	40			110			
	Watch Repairman	T	51	93	103	109	119	123	8.0
111	186	N	749	88	99	109	119	128	10.0
	Receiving or Shipping Checker	S	109	87	99	111	120	126	10.5
		U	42			109			
		T	900	88	99	109	119	127	10.0
112	048	N	123	91	98	109	120	129	11.0
	Car Mechanic, Railway	S	31			107			
		T	158	89	98	109	119	129	10.5
113	242	N	61	78	97	109	118	121	10.5
	Toolroom Keeper	T	70	78	99	109	118	121	9.5
114	322	N	47			109			
	Refrigeration Mechanic	T	58	86	97	109	120	126	11.5
115	043	T	29			109			
	Cameraman, Motion Picture								
116	309	N	30			108			
	Telephone Operator	T	34			109			
117	475	N	28			108			
	Hatch Tender—obs.	T	31			109			
118	010	N	11,642	79	95	109	120	129	12.5
	Not Elsewhere Classified	S	2,284	67	81	99	115	124	17.0
		U	373	74	90	107	118	127	14.0
		T	14,299	76	92	108	120	129	14.0
119	431	N	362	87	97	109	119	127	11.0
	Machinist's Helper	S	48			96			
		T	429	85	96	108	118	125	11.0
120	356	N	180	79	98	109	121	130	11.5
	Foreman, Labor	S	46			92			
		T	238	77	93	108	120	129	13.5
121	111	N	85	77	95	109	119	127	12.0
	Locomotive Fireman	T	106	75	97	108	118	126	10.5
122	386	N	49			109			
	Entertainer	T	54	78	90	108	120	125	15.0
123	037	N	566	81	95	108	117	126	11.0
	Meat Cutter	S	107	75	83	104	114	127	15.5
		T	691	80	94	108	117	126	11.5
124	482	N	461	86	97	108	116	124	10.0
	Student, High School, Vocational	S	27			107			
		T	504	85	96	108	115	124	9.5
125	038	N	85	82	96	108	119	130	11.5
	Cabinetmaker	T	114	80	92	108	119	130	13.5

TABLE I (*Continued*)

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
126	006	N	54	83	96	108	120	130
	Airplane Engine Mechanic	T	79	80	94	108	120	129
127	090	N	64	79	94	108	118	127
	Heat Treater	T	73	79	96	108	118	125
128	383	N	49			108		
	Fire Fighter	T	70	82	93	108	117	123
129	170	N	53	86	96	108	118	124
	Engineering Aide	T	69	87	96	108	119	124
130	319	N	44			108		
	Construction Equipment Mechanic	T	53	81	93	108	116	126
131	365	N	37			108		
	Optician	T	45			108		
132	139	N	28			108		
	Packer, High Explosives	T	29			108		
133	485	T	29			108		
	Petroleum Storage Technician							
134	148	T	25			108		
	Pattern Maker, Wood							
135	012	N	44			107		
	Electrician, Automotive	T	57	88	100	108	115	127
136	061	N	35			107		
	Coppersmith	T	43			108		
137	478	N	52	92	100	111	123	128
	Ship Fitter	T	66	87	99	107	120	128
138	201	N	359	84	97	109	119	127
	Sheet Metal Worker	S	85	77	89	103	111	123
		T	462	82	95	107	117	126
139	125	N	80	79	92	107	113	120
	Electroplater	T	84	78	90	107	113	120
140	338	N	42			107		
	Instrument Repairman, Electrical	T	50	81	100	107	120	131
141	163	N	34			107		
	Steam Fitter	T	47			107		
142	013	N	31			107		
	Diesel Mechanic	T	42			107		
143	202	N	27			107		
	Carpenter, Ship	T	34			107		
144	435	T	28			107		
	Bandsman, Snare Drum							
145	167	T	26			107		
	Lithographic Pressman							
146	304	N	60	90	99	108	119	125
	Electric Motor Repairman	T	76	88	96	106	117	125
147	341	N	223	82	92	107	117	124
	Shop Maintenance Mechanic	S	45			104		
		T	280	82	92	106	117	124
148	169	N	93	86	96	106	118	127
	Job Pressman	T	119	83	95	106	116	126
149	190	N	85	77	92	106	115	125
	Riveter, Pneumatic	T	113	79	91	106	115	124
150	064	N	36			106		
	Power Shovel Operator	T	46			106		
151	003	N	36			106		
	Photographic Technician, Aerial—obs.	T	39			106		
152	033	N	142	79	91	108	118	126
	Brakeman, Railway	T	182	80	93	105	116	125
153	040	N	97	76	91	108	119	127
	Automobile Body Repairman	S	36			92		
		T	136	73	86	105	115	126
154	240	N	49			106		
	Tire Rebuilder	T	62	76	87	105	114	118

TABLE I (*Continued*)

Rank	Specification Serial Number and Name	R*	No.	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
155	121	N	249	79	91	105	116	127	12.5
	Utility Repairman	S	40			97			
		T	305	79	91	105	116	127	12.5
156	030	N	132	86	95	105	115	123	10.0
	Boilermaker	T	158	81	94	105	115	123	10.5
157	337	N	30			105			
	Foreman, Automotive Repair Shop	T	39			105			
158	194	N	29			104			
	Salvage Man	T	35			105			
159	100	N	90	82	95	107	119	126	12.0
	Structural Steel Worker	T	107	76	88	104	119	126	15.5
160	256	N	182	73	90	105	116	124	13.0
	Welder, Combination	S	38			96			
		T	236	72	90	104	115	124	12.5
161	334	N	78	77	90	104	114	122	12.0
	Welder, Spot	T	89	73	89	104	112	122	11.5
162	065	N	53	71	84	104	115	120	15.5
	Seaman	T	65	69	84	104	114	120	15.0
163	081	T	31			104			
	Engineman, Operating								
164	059	N	229	72	88	103	118	129	15.0
	Foreman, Construction	S	45			107			
		T	281	72	88	104	118	128	15.0
165	127	N	59	79	88	101	116	125	14.0
	Millwright	T	71	81	90	104	118	125	14.0
166	255	N	372	80	93	105	115	124	11.0
	Welder, Electric Arc	S	88	64	80	92	105	119	12.5
		T	482	78	90	103	114	122	12.0
167	164	N	162	75	92	105	114	124	11.0
	Plumber	S	52	65	73	87	105	119	16.0
		T	222	71	87	103	114	123	13.5
168	233	N	41			105			
	Switchman, Railway	T	52	83	89	103	112	122	11.5
169	302	N	2,679	78	90	104	114	123	12.0
	Machine Operator, Designated Machine	S	216	64	74	88	104	116	15.0
		U	149	76	90	105	114	123	12.0
		T	3,044	77	89	103	114	123	12.5
170	025	N	38			103			
	Hammersmith	T	45			103			
171	483	N	67	82	93	108	119	123	13.0
	Student, High School, Agricultural	T	89	82	92	102	114	121	11.0
172	014	N	1,262	76	90	104	114	123	12.0
	Automotive Mechanic	S	364	71	83	97	110	119	13.5
		U	67	76	88	108	119	124	15.5
		T	1,693	75	89	102	114	122	12.5
173	024	N	128	77	92	104	113	122	10.5
	Blacksmith	S	32			92			
		T	162	75	88	102	113	122	12.5
174	257	N	85	83	93	104	114	124	10.5
	Welder, Acetylene	T	101	77	91	102	114	120	11.5
175	034	N	162	78	89	103	117	124	14.0
	Bricklayer	S	47			101			
		T	213	77	88	102	114	122	13.0
176	027	N	63	70	85	103	115	122	15.0
	Blaster or Powderman	T	75	73	85	102	115	121	15.0
177	314	T	40			102			
	Small Craft Operator								
178	165	N	55	75	94	106	114	125	1050
	Lineman, Power	T	80	73	86	101	111	120	12..
179	203	N	57	73	88	106	117	127	14.5
	Packing Case Maker	T	66	73	87	101	117	125	15.0

TABLE I (*Continued*)

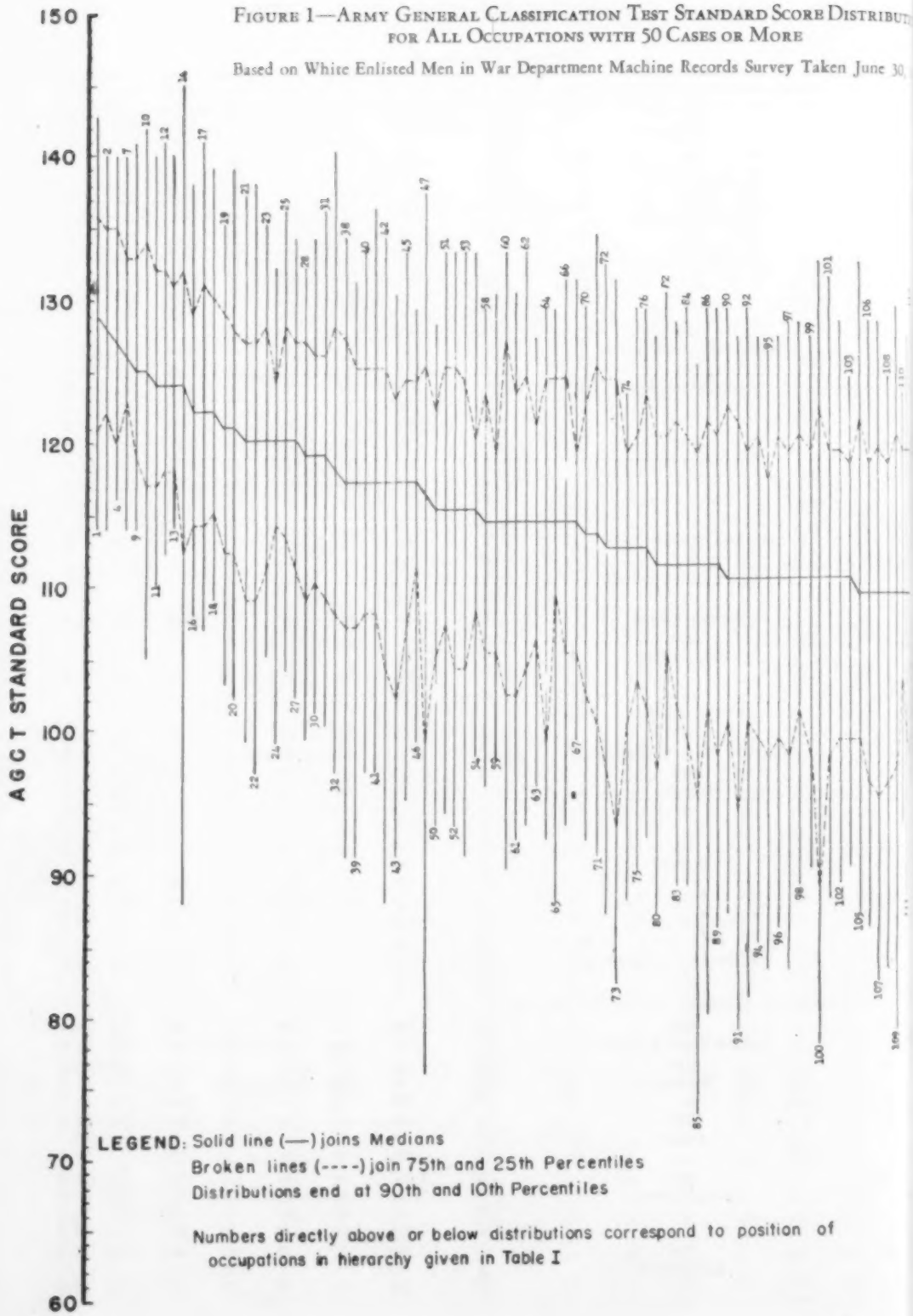
Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
180	050 Carpenter, General	N	664	76	89	104	115	123	13.0
		S	292	68	79	94	108	119	14.5
		U	48			106			
		T	1,004	73	86	101	113	123	13.5
181	162 Pipe Fitter	N	155	78	88	103	113	122	12.5
		S	32			89			
		T	194	76	86	101	112	121	13.0
182	354 Electric Truck Driver	N	80	64	86	103	112	121	13.0
		T	87	64	87	101	112	121	12.5
183	315 Highway Maintenance Man	N	35			103			
		T	44			101			
184	316 Automobile Serviceman	N	853	77	89	102	114	123	12.5
		S	255	68	80	96	108	119	14.0
		U	71	71	88	103	113	117	12.5
		T	1,179	73	87	101	114	123	13.5
185	189 Rigger	N	38			102			
		T	44			101			
186	113 Woodworking-Machine Operator	N	155	79	90	103	114	120	12.0
		S	39			89			
		T	206	73	85	100	112	120	13.5
187	344 Chauffeur	N	281	77	89	102	114	123	12.5
		S	61	66	80	93	104	113	12.0
		T	358	74	87	100	113	122	13.0
188	378 Motorcyclist	N	26			101			
		T	32			100			
189	343 Burner, Acetylene	N	94	75	89	100	110	122	10.5
		T	113	75	88	100	110	121	11.0
190	244 Tractor Driver	N	698	72	86	101	112	122	13.0
		S	229	60	73	88	102	113	14.5
		U	41			102			
		T	968	69	82	99	110	120	14.0
191	144 Painter, General	N	542	75	86	101	114	122	14.0
		S	120	62	75	90	104	116	14.5
		T	680	70	83	99	113	121	15.0
192	129 Foundryman	N	129	68	85	101	114	122	14.5
		T	149	67	83	99	113	121	15.0
193	130 Animation Artist	N	127	75	86	101	112	123	13.0
		T	140	74	85	99	112	123	13.5
194	303 Hospital Orderly	N	106	75	89	100	112	122	11.5
		T	122	72	86	99	110	121	12.0
195	017 Baker	N	278	69	83	99	114	123	15.5
		S	45			93			
		T	334	69	83	99	113	123	15
196	049 Packer, Supplies	N	148	70	82	99	113	122	15.5
		S	54	63	77	98	109	117	16.0
		T	206	67	81	99	112	122	15.5
197	200 Sewing Machine Operator	N	76	71	85	100	112	124	13.5
		T	91	71	80	98	112	120	16.0
198	245 Truck Driver, Heavy	N	2,754	73	86	99	112	120	13.0
		S	601	63	73	89	107	116	17.0
		U	118	67	86	99	110	118	12.0
		T	3,473	71	83	98	111	120	14.0
199	143 Painter, Automobile	N	61	74	87	99	110	123	11.5
		T	72	72	83	98	108	123	12.5
200	360 Hoist Operator	N	100	74	84	98	109	119	12.5
		T	117	73	83	98	109	119	13.0
201	359 Construction Machine Operator	N	102	72	86	99	109	116	11.5
		S	35			85			
		T	145	70	79	97	107	117	14.0
202	093 Horsebreaker	N	68	72	85	98	108	119	11.5
		T	91	73	85	97	108	119	11.5

TABLE I (*Continued*)

Rank	*Specification Serial Number and Name*	*R**	*No.*	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}	Q
203	234 Tailor	N	61	69	82	97	112	120	15.0
		T	74	69	82	97	112	120	15.0
204	214 Stonemason	N	31			97			
		T	43			97			
205	063 Crane Operator	N	100	79	88	99	113	121	12.5
		T	128	72	87	96	111	120	12.0
206	248 Upholsterer	N	77	74	91	99	111	121	10.0
		T	98	74	88	96	111	121	11.5
207	060 Cook	N	501	67	80	98	113	121	16.5
		S	131	63	77	91	104	113	13.5
		T	653	67	79	96	111	120	16.0
208	310 Concrete-Mixer Operator	N	43			97			
		T	56	65	80	96	109	119	14.5
209	345 Truck Driver, Light	N	2,921	71	83	97	110	119	13.5
		S	875	63	72	86	100	113	14.0
		U	170	70	80	97	112	124	16.0
		T	3,966	69	80	95	109	119	14.5
210	084 Stationary Fireman	N	90	70	85	97	112	124	13.5
		T	107	67	80	95	109	124	14.5
211	251 Warehouseman	N	76	80	88	96	112	121	12.0
		T	90	70	87	95	110	120	11.5
212	357 Gas and Oil Man—obs.	N	44			96			
		T	61	75	85	95	111	124	13.0
213	087 Forging-Press Operator	N	38			96			
		T	43			95			
214	271 Longshoreman	N	48			95			
		T	53	61	77	95	109	116	16.0
215	259 Well Driller	N	32			91			
		S	27			99			
		T	62	71	82	95	114	122	16.0
216	117 Marine Fireman	T	27			94			
217	103 Laundry Machine Operator	N	98	74	87	99	114	123	13.5
		T	121	71	82	93	111	121	14.5
218	590 Laborer	N	6,127	68	80	96	109	119	14.5
		S	1,323	59	67	79	96	109	14.5
		U	355	67	80	95	109	119	14.5
		T	7,805	65	76	93	108	119	16.0
219	022 Barber	N	132	64	79	95	108	118	14.5
		S	26			88			
		T	166	66	79	93	109	120	15.0
220	204 Shoe Repairman	N	90	68	78	95	111	119	16.5
		T	118	68	77	93	109	118	16.0
221	339 Jackhammer Operator	N	39			94			
		T	55	61	77	93	109	118	16.0
222	299 Groundman, Telephone, Telegraph, or Power	T	32			91			
223	199 Section Hand, Railway	N	294	64	74	90	105	116	15.5
		T	337	64	74	90	104	115	15.0
224	235 Teamster	N	180	68	76	89	106	115	15.0
		S	92	60	69	80	91	106	11.0
		T	284	64	74	87	104	114	15.0
225	325 Miner	N	441	67	76	87	102	114	13.0
		S	44			80			
		T	502	67	75	87	103	114	14.0
226	499 Farm Worker	N	3,850	64	74	90	106	118	16.0
		S	3,422	58	65	79	95	108	15.0
		U	203	60	67	83	99	115	16.0
		T	7,475	61	70	86	103	115	16.5
227	329 Lumberjack	N	186	62	72	89	103	118	15.5
		S	40			75			
		T	236	60	70	85	100	116	15.0

FIGURE 1—ARMY GENERAL CLASSIFICATION TEST STANDARD SCORE DISTRIBUTI
FOR ALL OCCUPATIONS WITH 50 CASES OR MORE

Based on White Enlisted Men in War Department Machine Records Survey Taken June 30,



LEGEND: Solid line (—) joins Medians
Broken lines (----) join 75th and 25th Percentiles
Distributions end at 90th and 10th Percentiles

Numbers directly above or below distributions correspond to position of occupations in hierarchy given in Table I

AGCT STANDARD SCORE
150
140
130
120
110
100
90
80
70
60

(Continued from Page 8.)

tions have median AGCT scores which are more than 2.5 sigmas below the mean of all the medians.

Six occupations have medians which fall between 2.0 and 2.5 sigmas above the mean of all the medians. These are all professional or administrative occupations, or students preparing for professional occupations.

Nine occupations have medians which lie between 1.5 and 2.0 sigmas above the mean of all the medians. These are all professional or administrative occupations, or professional students, with the exception of one highly skilled clerical occupation.

Twenty-one occupations have medians which lie between 1.0 and 1.5 sigmas above the mean of all the medians. These are skilled operators of clerical machines, high-order laboratory technicians, clerical workers in responsible jobs, inspectors, or semi-professionals such as draftsmen. One student group (sociology student) and two occupations commonly considered professional (pharmacist and reporter) appear in this group.

Thirty-five occupations have medians which fall between 0.5 and 1.0 sigma above the mean of all the medians. These consist largely of skilled mechanics and repairmen, skilled operators of machines such as linotype and radio, some laboratory technicians, and office clerks with less responsible positions. The cashiers who appear in this category are probably those with no bookkeeping responsibilities, the remainder very likely having reported themselves as bookkeepers.

Forty-six occupations have medians which lie between the mean of all the medians and 0.5 sigma above the mean. Here are the bulk of mechanics, machine servicemen, machinists, some technicians, sales clerks and shipping clerks, skilled craftsmen such as watch repairers and gunsmiths, stewards, and policemen.

Forty-eight occupations have medians which lie between the mean of all the medians and 0.5 sigma below the mean. These consist mostly of semi-skilled or even skilled workers in manufacturing industries, such as foremen, welders, steel workers, sheet metal workers. Some mechanics and repairmen appear, as do some high school students, seamen, fire fighters, and entertainers.

Twenty-four occupations lie between 0.5 and 1.0 sigma below the mean of all the medians. Here are chauffeurs, pipe fitters, plumbers, carpenters, riggers—semi-skilled workers engaged to a lesser extent in industrial occupations than were those who appeared in the category directly above.

Twenty-six occupations have medians which lie between 1.0 and 1.5 sigmas below the mean of all the medians. These are relatively unskilled or semi-skilled occupations, such as truck drivers, tractor drivers, upholsterers, crane operators, foundrymen.

Eight occupations lie between 1.5 and 2.0 sigmas below the mean. These are mostly unskilled occupations of various sorts.

Four occupations lie between 2.0 and 2.5 sigmas below the mean. These are unskilled laborers of various types, and farm workers.

Inter- and Intra-Occupational Variability

In order to quantify further the basic data in Table I, frequency distributions were obtained for those AGCT scores in the total group representing each occupation which corresponded to the 10th, 25th, 50th, 75th, and 90th percentile points, and Q, and the means and sigmas of these distributions were computed. These data are given in Table III.

Table III shows that there is an inverse relationship between the magnitude of a percentile and the inter-occupational variability of the AGCT scores corresponding to that percentile. For example, the standard deviation of the distribution of AGCT scores corresponding to the *10th* percentile of the various occupational AGCT distributions is almost twice that of the corresponding distribution for the *90th* percentile. This clearly demonstrates that the occupations studied show greater variability with respect to their poorest representatives than with respect to their best representatives, when "poorest" and "best" are defined in terms of AGCT score, not in terms of proficiency in the occupation.

These facts concerning the lesser variability among occupations of the 10 per cent making

Table II

Occupational Groups Whose AGCT Medians Lie in Each Half-Sigma Interval from the Mean of All the Medians

TABLE II

OCCUPATIONAL GROUPS WHOSE AGCT MEDIANS LIE IN EACH HALF-SIGMA INTERVAL FROM THE MEAN OF ALL THE MEDIANS

Based on White Enlisted Men in Machine Records Survey taken June 30, 1944

−2.0σ 85.3	−2.0σ 89.9	−1.5σ 94.5	−1.0σ 99.1	−.5σ 103.7	Mean 108.3	+.5σ 112.9	+1.0σ 117.5	+1.5σ 122.1	+2.0σ 126.7	+2.5σ 131.3
Teamster	Marine Fireman	Tractor Driver	Welder, Electric Arc	Not Elsewhere Classified	Carpenter, Heavy Construction	Switchboard Installer, Telephone and Telegraph, Dial	Bookkeeper, General	Writer	Accountant
Miner	Laundry Machine Operator	Painter, General	Plumber	Machinist's Helper	Dispatcher, Motor Vehicle	Cashier	Chief Clerk	Student, Civil Engineering	Student, Mechanical Engineering
Farm Worker	Laborer	Foundryman	Switchman, Railway	Foreman, Labor	Gunsmith	Stock Record Clerk	Stenographer	Statistical Clerk	Personnel Clerk
Lumberjack	Barber	Animation Artist	Machine Operator	Locomotive Fireman	Musician, Instrumental	Clerk, General	Pharmacist	Student, Chemical Engineering	Student, Medicine
	Shoe Repairman	Hospital Orderly	Hammersmith	Entertainer	Tool Maker	Radio Repairman	Typist	Teacher	Chemist
	Jackhammer Operator	Baker	Student, High School, Agricultural	Meat Cutter	Nurse, Practical	Purchasing Agent	Draftsman	Lawyer	Student, Electrical Engineering
	Groundman, Telephone, Telegraph, or Power	Packer, Supplies	Automotive Mechanic	Student, High School, Vocational	Photographer, Portrait	Survey and Instrument Man	Chemical Laboratory Assistant	Student, Business or Public Administration	
	Section Hand, Railway	Sewing Machine Operator	Blacksmith	Cabinetmaker	Photolithographer	Physics Laboratory Assistant	Draftsman, Mechanical	Auditor	
		Truck Driver, Heavy	Welder, Acetylene	Airplane Engine Mechanic	Rodman and Chainman, Surveying		Investigator	Student, Dentistry	
		Painter, Automobile	Bricklayer	Heat Treater	Airplane Fabric and Dope Worker	Stock Control Clerk	Reporter		
		Hoist Operator	Blaster or Powderman	Fire Fighter	Multilith or Multigraph Operator	Manager, Production	Tool Designer		
		Construction Machine Operator	Small Craft Operator	Engineering Aide	Shipping Clerk	Boilermaker, Layer-Out	Tabulating Machine Operator		
		Horsebreaker	Lineman, Power	Construction Equipment Mechanic	Printer	Radio Operator	Addressing-Embossing Machine Operator		
		Tailor	Packing Case Maker	Optician	Steward	Linotype Operator	Traffic Rate Clerk		
		Stonemason	Carpenter, General	Packer, High Explosives	Foreman, Warehouse	Student, Mechanics	Clerk-Typist		
		Crane Operator	Pipe Fitter	Petroleum Storage Technician	Bandsman, Cornet or Trumpet	Salesman	Postal Clerk		
		Upholsterer	Electric Truck Driver	Pattern Maker, Wood	Instrument Repairman, Non-electrical	Athletic Instructor	Bookkeeping Machine Operator		
		Cook	Highway Maintenance Man	Electrician, Automotive	Boring Mill Operator	Store Manager	Meat or Dairy Inspector		
		Concrete-Mixer Operator	Automobile Serviceman	Coppersmith	Projectionist, Motion Picture	Installer-Repairman, Telephone and Telegraph	Photographic Laboratory Technician		
		Truck Driver, Light	Rigger	Ship Fitter	Dental Laboratory Technician	Motorcycle Mechanic	Teletype Operator		
		Stationary Fireman	Woodworking Machine Operator	Sheet Metal Worker	Laboratory Technician, V-mail or Microfilm	Dispatcher Clerk, Crew	Student, Sociology		
		Warehouseman	Chauffeur	Electroplater	Foreman, Machine Shop	Tool Dresser			
		Gas and Oil Man	Motorcyclist	Instrument Repairman, Electrical	Stock Clerk	File Clerk			
		Forging-Press Operator	Burner, Acetylene	Steam Fitter	Painter, Sign	Embalmer			
		Longshoreman		Diesel Mechanic	Machinist	Brake Inspector, Railway			
		Well Driller		Carpenter, Ship	Photographer, Aerial	Airplane and Engine Mechanic			
				Bandsman, Snare Drum	Engine Lathe Operator	Shop Clerk			
				Lithographic Pressman	Parts Clerk, Automotive	Artist			
				Electric Motor Repairman	Cook's Helper	Band Leader			
				Shop Maintenance Mechanic	Railway Mechanic, General	Photographer			
				Job Pressman	Office Machine Serviceman	Geologist			
				Riveter, Pneumatic	Student, High School, Commercial	Airplane Engine Service Mechanic			
				Power Shovel Operator	Electrician, Airplane	Cable Splicer, Telephone and Telegraph			
				Photographic Technician, Aerial	Student, Manual Arts	Surveyor			
				Brakeman, Railway	Policeman	Student, High School, Academic			
				Automobile Body Repairman	Sales Clerk	Blueprinter or Photostat Operator			
				Tire Rebuilder	Electrician				
				Utility Repairman	Lineman, Telephone and Telegraph				
				Boilermaker	Watch Repairman				
				Foreman, Automotive Repair Shop	Receiving or Shipping Checker				
				Salvage Man	Car Mechanic, Railway				
				Structural Steel Worker	Toolroom Keeper				
				Welder, Combination	Refrigeration Mechanic				
				Welder, Spot	Cameraman, Motion Picture				
				Seaman	Telephone Operator				
				Engineman, Operating	Hatch Tender				
				Foreman, Construction					
				Millwright					

TABLE III

MEANS AND SIGMAS OF AGCT SCORES CORRESPONDING TO THE 10TH, 25TH, 50TH, 75TH, AND 90TH PERCENTILES, AND OF Q, IN ALL THE AGCT DISTRIBUTIONS STUDIED, BASED ON THE TOTAL GROUP IN EACH OCCUPATION

	Percentile					
	10th	*25th*	*50th*	*75th*	*90th*	*Semi-Interquartile Range*
Number*	172	172	227	172	172	172
Mean	83.9	95.8	108.3	118.5	127.1	11.3
Sigma	12.6	11.4	9.2	7.1	6.6	2.7

* 50th percentile obtained for all distributions with at least 25 cases; the other percentiles for all distributions with at least 50 cases.

the highest AGCT scores and the greater variability of the 10 per cent making the lowest AGCT scores illustrate well-known conditions: (1) there is a tendency for entrance to certain occupations to be contingent on the possession of some minimum of the abilities measured by AGCT or similar tests, whereas there is no upper limit of ability imposed by the requirements of membership in an occupation; (2) many individuals in lower-level occupations could succeed in higher-level occupations so far as AGCT score alone is concerned; (3) possession of specific traits or aptitudes, opportunity, interest, and ambition are some of the factors that contribute to the findings. It would be of general psychological interest to determine to what extent those with high AGCT scores in lower-level occupations are occupationally maladjusted as current psychological theory would suggest they should be, or whether within each occupation there are positions which require the skills reflected in AGCT score.

The higher occupations in the hierarchy which have representatives with very low AGCT scores are worth mention at this point. As can be seen from Figure 1, the occupations of student, chemical engineering (rank 10), auditor (rank 14), boilermaker layer-out (rank 47), dispatcher, motor-vehicle (rank 73), and steward (rank 85) have lower P_{10}'s than do other occupations at their median level. These findings may be owing to the greater importance for these occupations of special aptitudes rather than to the possession of a minimum AGCT score, to peculiarities in the classification of these occupations, to sampling, or to any combination of these factors. It is probable that the explanation will be specific for each of the occupations mentioned.

As a corollary to the finding that the inter-occupational differences in P_{10}'s are much greater than those in P_{90}'s, and the inter-occupational differences in P_{25}'s are greater than those in P_{75}'s, and directly related thereto, is the finding that intra-occupational variability in AGCT score (as measured by the semi-interquartile range) is not constant throughout the hierarchy. The Q values increase markedly as one goes from the higher-level to the lower-level occupations, with a correlation of $-.80$ between Q and AGCT median for all occupations represented by at least 50 cases in the total group. The lower-level occupations thus show more variability than the higher-level ones. This relationship between variability and position in the hierarchy reflects the findings concerning the spreads in the 10th, 25th, 50th, 75th and 90th percentiles. It again demonstrates the fact that while lower AGCT limits—with some exceptions—exist for the higher-level occupations, there is little tendency for upper AGCT limits to exist for the lower-level occupations.

This point may perhaps be even better demonstrated by a specific example. Accountants, the highest of all occupations studied with respect to median AGCT score,

and lumberjacks, the lowest of all occupations with respect to median AGCT score, represent the most extreme occupational differences obtained in this study. Nevertheless, the highest 10 per cent of the lumberjacks are higher in AGCT score than the lowest 10 per cent of the accountants (P_{90}, lumberjacks—116; P_{10}, accountants—114).

Of all the occupations studied, that with the highest P_{10} (116) was student, medicine. There are only four occupations with P_{90}'s lower than this: farm worker (115), section hand, railway (115), miner (114), teamster (114). Except for the occupations mentioned, there were none, among all those studied, where *no* overlapping whatsoever occurred, even if only the range from P_{90} to P_{10} was considered.

A man with an AGCT score of 100 would be below the 10th percentile in only 18 of the occupations where all five percentile points are known, and would be above the 90th percentile for none of the occupations where all five percentile points are known.

Regional Differences

Table IV presents a comparison of medians for "North"[3] and "South"[3] for those occupations in which both samples contained at least 50 white enlisted men, giving the difference between medians and the probable error of the difference. For the 33 occupations compared, the median for "North" is higher than that for "South" in the case of all but two: clerk-typist, where the two medians are the same, and receiving or shipping checker, where the difference is not significant. Twenty-one of the 31 differences in favor of the northern median yield critical ratios of 4 or higher.

Figure 2 represents these differences and also shows that while the line of medians for "North" is S-shaped and very similar to the line of medians for the total group in each occupation (see Figure 1), the line of medians for "South" is quite jagged. Since the northern samples in most occupations account for a much larger proportion of the total than do the southern, this is not surprising. The irregularity of the southern line is most likely a function of the number of cases involved in the southern samples.

[3] See again footnote 2, Page 8.

The semi-interquartile range is also not the same for the northern and southern samples, although it is similar on the whole. The correlation between Q for "North" against Q for "South" for these 33 occupations is .73.

When all 66 occupations where medians for both "North" and "South" were available are considered, the correlation between northern and southern medians is found to be .90, showing that on the whole the same relative AGCT rank order of occupations holds for "North" and "South," but that it is not identical for the two.

The northern medians are higher than the southern for all except five of the 66 occupations: clerk-typist and receiving or shipping checker, already shown in Table IV and Figure 2; and well-driller, construction foreman, and railway brake inspector. Not one of these differences where the southern sample has a higher median than the northern is as large as four times its probable error (using an estimated Q of 10 for samples of less than 50, where no actual Q values had been obtained).

For these 66 occupations, the correlation between "North"-"South" difference in median and median for the total group in each occupation is $-.38$, revealing a slight tendency for "North"-"South" difference in median AGCT score within each occupation to increase as the position of the occupation in the hierarchy decreases.

Table V gives a comparison of the means and sigmas for the AGCT scores corresponding to P_{10}, P_{25}, P_{50}, P_{75}, P_{90}, and Q for the northern and southern samples. For each percentile point studied, the mean value is greater for the northern than for the southern samples. However, the mean value of Q is greater for the southern than for the northern samples, showing the southern distribution to be more variable than the northern distribution within each occupation, or *intra*-occupationally. It is also interesting to note that for every distribution of percentile points obtained, and for the distribution of Q, the southern samples have a larger standard deviation than do the northern. Thus, both intra-occupationally and inter-occupationally the southern samples are more variable than the northern.

TABLE IV

COMPARISON OF MEDIANS FOR "NORTH"* AND "SOUTH"* IN OCCUPATIONS WITH AT LEAST 50 CASES IN BOTH NORTHERN AND SOUTHERN SAMPLES

		No.	AGCT Med.	Diff. (N − S)	P. E.† Diff.	C.R.
327	N	278	126			
Teacher	S	69	121	5	1.53	3.3
350	N	221	124			
Bookkeeper, General	S	67	119	5	1.47	3.4
052	N	231	123			
Chief Clerk	S	57	120	3	1.77	1.7
405	N	503	119			
Clerk-Typist	S	94	119	0	...	...
055	N	1,645	118			
Clerk, General	S	342	115	3	0.68	4.4
321	N	667	117			
Salesman	S	169	110	7	1.18	5.9
352	N	293	116			
Store Manager	S	72	108	8	1.69	4.7
480	N	2,060	114			
Student, High School, Academic	S	469	108	6	0.75	8.0
195	N	336	112			
Shipping Clerk	S	59	103	9	2.16	4.2
324	N	660	111			
Stock Clerk	S	100	104	7	1.50	4.7
001	N	488	110			
Photographer, Aerial	S	109	108	2	1.70	1.2
373	N	1,767	110			
Sales Clerk	S	506	102	8	0.79	10.1
078	N	334	110			
Electrician	S	76	105	5	1.87	2.7
186	N	749	109			
Receiving or Shipping Checker	S	109	111	−2	1.40	1.4
010	N	11,642	109			
Not Elsewhere Classified	S	2,284	99	10	0.50	20.0
037	N	566	108			
Meat Cutter	S	107	104	4	2.03	2.0
201	N	359	109			
Sheet Metal Worker	S	85	103	6	1.75	3.4
255	N	372	105			
Welder, Electric Arc	S	88	92	13	1.95	6.7
164	N	162	105			
Plumber	S	52	87	18	3.05	5.9
302	N	2,679	104			
Machine Operator	S	216	88	16	1.37	11.7
014	N	1,262	104			
Automotive Mechanic	S	364	97	7	1.02	6.9
050	N	664	104			
Carpenter, General	S	292	94	10	1.28	7.8
316	N	853	102			
Automobile Serviceman	S	255	96	6	1.24	4.8
344	N	281	102			
Chauffeur	S	61	93	9	2.35	3.8
244	N	698	101			
Tractor Driver	S	229	88	13	1.47	8.8
144	N	542	101			
Painter, General	S	120	90	11	1.98	5.6
049	N	148	99			
Packer, Supplies	S	54	98	1	2.51	0.4

* See again footnote 2, Page 8.
† Probable error of each median computed from Table VI.

TABLE IV (*Continued*)

		No.	*AGCT Med.*	*Diff. N-S*	*P. E. Diff.*	*C. R.*
245	N	2,754	99			
Truck Driver, Heavy	S	601	89	10	1.01	9.9
060	N	501	98			
Cook	S	131	91	7	1.92	3.6
345	N	2,921	97			
Truck Driver, Light	S	875	86	11	0.70	15.7
590	N	6,127	96			
Laborer	S	1,323	79	17	0.61	27.8
235	N	180	89			
Teamster	S	92	80	9	2.20	4.1
499	N	3,850	90			
Farm Worker	S	3,422	79	11	0.50	22.0

SAMPLING FLUCTUATIONS

In the preceding discussion, the AGCT distributions have been accepted largely as experimentally determined. Actually, because of sampling errors a repetition of this study upon data from another Machine Records Survey might not yield exactly the same rank order of occupations. The question of how many AGCT scores apart the medians of two occupations must be to indicate a "true" difference at any given level of confidence is one that cannot be answered in unqualified terms, because of the fact that the ranking as given is composed of occupations which vary widely with respect to number of cases and semi-interquartile range.

TABLE VI is presented to facilitate interpretation of the difference in median between any given occupation and any other. To use TABLE VI, find the entry in the column whose Q value is closest to that for the occupation under consideration and in the row whose N value is equal to or next lower than that for the occupation. This will yield the approximate probable error of the median for that occupation. The probable error of the difference between medians for any two occupations is obtained by getting the probable error of each median and then substituting in the formula: $\sqrt{P.E._A{}^2+P.E._B{}^2}$ If the difference between the medians is four times as large as the probable error of the difference, the chances are very good that a true difference in AGCT medians for the two occupations exists, and that it is in the direction observed. This does not mean, however, that the actual *magnitude* of the true difference is the same as the magnitude of the obtained difference.

The presentation of TABLE VI stresses the fact that errors in sampling must not be ignored in interpreting the findings given here. As is the case with all random samples, the AGCT distribution for an occupation defined by any given code in this sample may—and a certain number of times *will*—contain

(*Continued on Page 28.*)

TABLE V

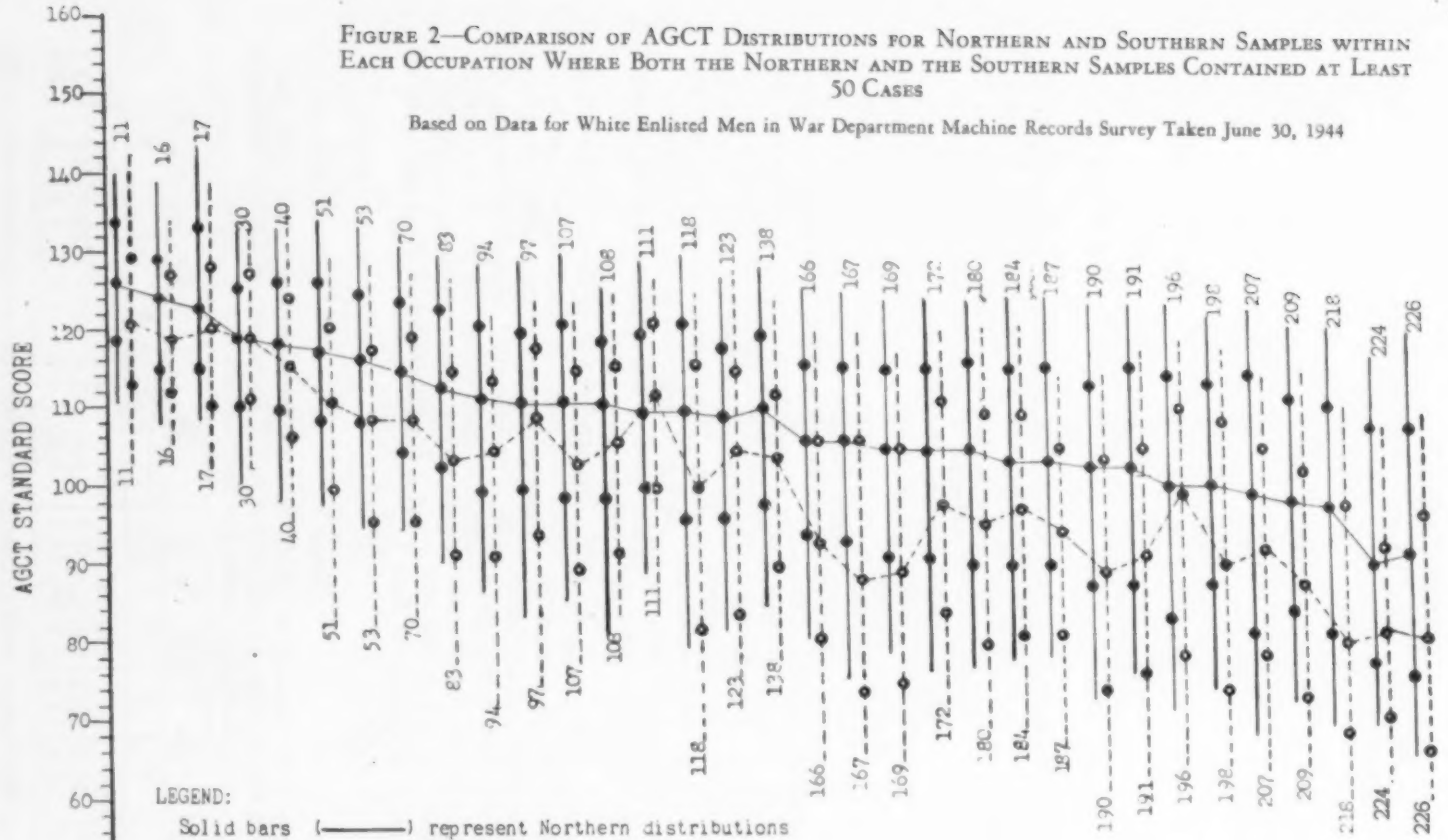
MEANS AND SIGMAS OF DISTRIBUTIONS OF AGCT SCORES CORRESPONDING TO THE 10TH, 25TH, 50TH, 75TH, AND 90TH PERCENTILES, AND Q, IN THE AGCT DISTRIBUTIONS FOR THE NORTHERN AND SOUTHERN SAMPLES IN EACH OCCUPATION

	P_{10}		P_{25}		P_{50}		P_{75}		P_{90}		Q	
	N	*S*	*N*	*S*	*N*	*S*	*N*	*S*	*N*	*S*	*N*	*S*
No.*	147	33	147	33	210	66	147	33	147	33	147	33
Mean	85.0	74.4	96.9	86.3	109.3	100.8	119.4	111.4	127.8	121.6	11.2	13.1
Sigma	12.1	13.8	10.8	13.6	8.9	12.2	7.0	9.6	6.6	8.5	2.4	2.6

* P_{50} obtained for all distributions with at least 25 cases; the other percentiles for all distributions with at least 50 cases.

FIGURE 2—COMPARISON OF AGCT DISTRIBUTIONS FOR NORTHERN AND SOUTHERN SAMPLES WITHIN EACH OCCUPATION WHERE BOTH THE NORTHERN AND THE SOUTHERN SAMPLES CONTAINED AT LEAST 50 CASES

Based on Data for White Enlisted Men in War Department Machine Records Survey Taken June 30, 1944



LEGEND:

Solid bars (———) represent Northern distributions
Broken bars (- - - -) represent Southern distributions
Solid line (———) joins Northern medians
Broken line (- - - -) joins Southern medians

P_{75}, P_{50}, and P_{25}, are indicated for each distribution

Distributions end at P_{90} and P_{10}:

Numbers directly above and below distributions correspond to position of occupation in Table I

Table VI

Probable Error of Median for Certain Values of Q and N Where $P.E._{median} = \frac{1.253\,Q}{\sqrt{N}}$

Value of N	Value of Q																								
	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
25	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.26	2.38	2.51	2.63	2.76	2.88	3.01	3.13	3.26	3.38	3.51	3.63	3.76	3.88	4.01	4.13	4.26
50	0.89	0.97	1.06	1.15	1.24	1.33	1.42	1.51	1.59	1.68	1.77	1.86	1.95	2.04	2.13	2.22	2.30	2.39	2.48	2.57	2.66	2.75	2.84	2.92	3.01
75	0.72	0.80	0.87	0.94	1.01	1.09	1.16	1.23	1.30	1.37	1.45	1.52	1.59	1.66	1.74	1.81	1.88	1.95	2.03	2.10	2.17	2.24	2.31	2.39	2.46
100	0.63	0.69	0.75	0.81	0.88	0.94	1.00	1.07	1.13	1.19	1.25	1.32	1.38	1.44	1.50	1.57	1.63	1.69	1.75	1.82	1.88	1.94	2.00	2.07	2.13
150	0.51	0.56	0.61	0.66	0.72	0.77	0.82	0.87	0.92	0.97	1.02	1.07	1.13	1.18	1.23	1.28	1.33	1.38	1.43	1.48	1.53	1.59	1.64	1.69	1.74
200	0.44	0.49	0.53	0.58	0.62	0.66	0.71	0.75	0.80	0.84	0.89	0.93	0.97	1.02	1.06	1.11	1.15	1.20	1.24	1.28	1.33	1.37	1.42	1.46	1.51
250	0.40	0.44	0.48	0.52	0.55	0.59	0.63	0.67	0.71	0.75	0.79	0.83	0.87	0.91	0.95	0.99	1.03	1.07	1.11	1.15	1.19	1.23	1.27	1.31	1.35
300	0.36	0.40	0.43	0.47	0.51	0.54	0.58	0.61	0.65	0.69	0.72	0.76	0.80	0.83	0.87	0.90	0.94	0.98	1.01	1.05	1.09	1.12	1.16	1.19	1.23
350	0.33	0.37	0.40	0.44	0.47	0.50	0.54	0.57	0.60	0.64	0.67	0.70	0.74	0.77	0.80	0.84	0.87	0.90	0.94	0.97	1.00	1.04	1.07	1.11	1.14
400	0.31	0.34	0.38	0.41	0.44	0.47	0.50	0.53	0.56	0.60	0.63	0.66	0.69	0.72	0.75	0.78	0.81	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.07
450	0.30	0.32	0.35	0.38	0.41	0.44	0.47	0.50	0.53	0.56	0.59	0.62	0.65	0.68	0.71	0.74	0.77	0.80	0.83	0.86	0.89	0.92	0.95	0.97	1.00
500	0.28	0.31	0.34	0.36	0.39	0.42	0.45	0.48	0.50	0.53	0.56	0.59	0.62	0.64	0.67	0.70	0.73	0.76	0.78	0.81	0.84	0.87	0.90	0.92	0.95
750	0.23	0.25	0.27	0.30	0.32	0.34	0.37	0.39	0.41	0.43	0.46	0.48	0.50	0.53	0.55	0.57	0.59	0.62	0.64	0.66	0.69	0.71	0.73	0.75	0.78
1,000	0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67
2,000	0.14	0.15	0.17	0.18	0.20	0.21	0.22	0.24	0.25	0.27	0.28	0.29	0.31	0.32	0.34	0.35	0.36	0.38	0.39	0.41	0.42	0.43	0.45	0.46	0.48
3,000	0.11	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39
4,000	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34
5,000	0.09	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.27	0.28	0.29	0.30
6,000	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.27
7,000	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.25
8,000	0.07	0.08	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.22	0.23	0.24
9,000	0.07	0.07	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.15	0.15	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.22
10,000	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21

TABLE VII

COMPARISON OF MEDIANS FOR NORTHERN SAMPLES OF EIGHT OCCUPATIONS STUDIED IN WAR DEPARTMENT SURVEYS 2 AND 3

No. 2 Survey (March 30, 1944)					*No. 3 Survey (June 30, 1944)*				
Name	*Code (USES)**	*No. of Cases*	*Median*	*Q*	*Name*	*Code (SSN)*	*No. of Cases*	*Median*	*Q*
Bookkeepers and Cashiers	101.0, 101.3, 101.4, 101.5, 101.9	406	119	7.9	Bookkeeper, General	350	221	124	7.0
					Cashier	269	122	119	10.0
General Office Clerks	105.0	653	119	8.9	Clerk, General	055	1,645	118	8.5
Sales Clerks	170.1	801	109	11.1	Sales Clerk	373	1,767	110	11.0
Auto Mechanics	581.0, 581.1, 581.2, 581.4, 581.6, 581.9	768	104	11.6	Automotive Mechanic	014	1,262	104	12.0
Cooks	226.0, 226.1, 226.2, 226.3, 226.4, 226.5, 226.6, 226.9	335	99	14.0	Cook	060	501	98	16.5
Heavy Truck Drivers	736.2	1,110	97	12.8	Truck Driver, Heavy	245	2,754	99	13.0
Laborers	All 8— and 9—	1,780	93	17.8	Laborer	590	6,127	96	14.5
General Farm Hands	316.1, 316.2	572	87	15.2	Farm Worker	499	3,850	90	16.0

* Reuben S. Horlich, Lt., AGD, Manpower Analysis Section, AGO, assisted in setting up these and other occupational groupings for the preliminary phase of this investigation.

a disproportionate number of high or low AGCT scores compared with the "true" distribution for the parent Army population.

The amount of fluctuation of this sort to be expected is not, however, unduly large. Some indication of the variation which can be anticipated is furnished by a comparison of medians obtained on data from Machine Records Survey 2 and on data from Machine Records Survey 3, for eight occupations studied in both surveys. In working with the data from Survey 2, medians were obtained only for the northern and southern samples separately, and therefore this comparison is based only on figures for the northern samples of the eight occupations. These are given in TABLE VII.

It can be seen from TABLE VII that aside from a slight discrepancy occasioned by a reversal in the positions of truck drivers and cooks, the two sets of results agree closely with respect to relative rank order of AGCT medians for the occupations involved.

Bookkeepers and cashiers were combined in Survey 2 and the median obtained there for the combined group, whereas the medians were obtained separately for bookkeepers and cashiers in Survey 3. The latter Survey places bookkeepers above cashiers, which seems reasonable on logical grounds, but it yields an AGCT median for cashiers alone which is the same as that obtained for bookkeepers and cashiers combined in Survey 2. While this does not seem reasonable, it must be remembered that medians for combined groups can never be predicted from the medians for the subgroups. Except for this discrepancy, the medians obtained in the two Surveys are surprisingly close in absolute magnitude, which would indicate that although changes in obtained medians are to be expected from sample to sample, the variation is not so great as to shift a given occupation very far along the scale, either relatively or absolutely, if one continues to draw successive similar samples from the *same parent population*, as would be the case in the various Machine Records Surveys.

LIMITATIONS OF PRESENT STUDY

Because of the selective effect of deferments, rejections, and discharges, the Army population representing any given occupation was not the same as the total civilian population for that occupation. In addition, the fact that AGCT scores were not available for officers also tended to make the AGCT distributions for some occupations less completely representative of their counterparts in the total civilian population. Professional and higher-level non-professional occupations may be expected to have been particularly distorted.

In addition to the lack of complete representativeness with respect to the civilian population, which limits the usefulness of

data based on any War Department Machine Records Survey, results presented in this paper may contain errors specific to Survey 2 or Survey 3, particularly errors in coding the variables under consideration. A harassed clerk in a New Guinea machine records field truck may punch 490 (continuity writer), when he intends to punch 590 (laborer), or 306 (geographer) when he means 360 (hoist operator), etc. With a 3-digit code, such as was used in Survey 3, changes in one digit will transform the original occupation into one that is markedly different. But a 6-digit code is even more susceptible to punching errors.

It is unlikely, however, that many AGCT medians in TABLE I have been seriously affected by miscodings of this nature.

A difficulty which any study of this nature would encounter, whether based on a civilian or an Army population, would arise from the influence upon the AGCT distributions for the various occupations of variables such as age, education, recency of schooling, and degree of familiarity with written and spoken English, all of which are to some extent correlated with Army General Classification Test score, or with score on almost *any* test of intelligence. Age is correlated so slightly with AGCT score that it did not seem worth while to attempt to control on that variable in this study. The correlation between number of years of education and AGCT score is sizable, but it would have been impossible and even absurd to attempt to match occupational groups on the basis of years of education, inasmuch as that variable is inextricably interwoven with the very definition of many an occupation. Recency of schooling would have been difficult to control and its influence is so slight that it was not considered worth while to attempt to control it.

The problem of how to deal with the lowering of the AGCT medians for certain occupations caused by the presence in those occupations of a disproportionate number of subjects with language handicaps due to foreign birth or foreign extraction is a difficult one. No attempt to deal with it has been made in this study beyond pointing out that such lowering of the medians has possibly occurred for certain occupations.

WORLD WAR I FINDINGS

The Army Alpha, World War I prototype of the Army General Classification Test, was administered to approximately half the draftees in World War I. Based on results for 18,000 men, Bridges analyzed the Army Alpha distributions for 114 occupational groups, and obtained the 25th, 50th, and 75th percentile for each occupation with at least 45 cases, or a total of 68 occupations. His results were reported separately for apprentices and journeymen, and also for the total group in each occupation. These appear in the *Memoirs of National Academy of Sciences* (6). Only the figures for the total group in each occupation are referred to in the present study.

Fryer, on the premise that draft quotas were slightly inferior in intelligence, on the average, to the civilian population, attempted to correct Bridges' findings on the basis of a study of records of more than 3,598 personnel examinations made by the vocational department of the Central Branch YMCA in Brooklyn, N. Y. (2). His study included 96 occupations. Fryer's figures, rather than the original World War I figures, are those most often quoted in discussing intelligence levels of various occupational groups. These are the figures, to mention only one example, which are given by Bingham in *Aptitudes and Aptitude Testing* (1).

To afford a comparison with World War I findings, TABLE VIII was prepared, which gives the World War II data obtained in this study, the original Army Alpha raw score values for the 25th, 50th, and 75th percentiles as reported in the *Memoirs*, and the corresponding values as adjusted by Fryer, for all occupations where the World War II figures can be compared with either set of data.

Of the 68 occupations for which Bridges obtained medians and Q values, only 42 could be compared with occupations covered by the analysis of Survey 3. Some of the remaining ones, such as mechanical engineer, civil engineer, railroad conductor, locomotive engineer, horseshoer, and veterinarian, had appeared in Survey 3, but no medians had been obtained for them since there were less than 25 cases in the total group comprising the occupation. The others could not be com-

(Continued on Page 33.)

Table VIII

Comparison of AGCT Median and Q Values for Occupations in Present Study with Army Alpha Median and Q Values Obtained by Bridges and by Fryer

World War II figures are in terms of Army General Classification Test Standard Score; World War I figures are in terms of Army Alpha Raw Score

(Occupations appear in the same relative position as in Table I)

	Name	*No.**	P_{25}	P_{50}	P_{75}
WW II	Accountant	216	121	129	136
WW I B	Accountant	201	98.2	117.9	136.3
WW I F	Accountant		103	137	155
WW II	Chemist	40		127	
WW I B	*Not Given*				
WW I F	Chemist		94	119	139
WW II	Teacher	360	117	124	132
WW I B	*Not Given*				
WW I F	Teacher, P.S.		97	122	148
WW II	Bookkeeper, General	302	114	122	129
WW I B	Bookkeeper	450	76.8	100.9	126.6
WW I F	Bookkeeper		77	101	127
WW II	Stenographer	206	115	122	130
WW I B	Stenographer and Typist	400	92.6	115.0	138.0
WW I F	Stenographer and Typist		73	103	124
WW II	Pharmacist	78	112	121	129
WW I B	*Not Given*				
WW I F	Druggist		61	78	106
WW II	Draftsman	139	109	120	127
WW I B	Draftsman, mechanical	55	84.0	114.0	139.0
WW I F	Draftsman		84	114	139
WW II	Postal Clerk	377	109	119	126
WW I B	*Not Given*				
WW I F	Postal Clerk		60	81	106
WW II	Clerk, General	2,063	108	117	125
WW I B	General Clerk	1,565	73.7	95.8	121.3
WW I F	Clerk (office)		74	96	121
WW II	File Clerk	119	105	114	123
WW I B	Filing Clerk	53	74.0	96.8	125.7
WW I F	Clerk (office)		74	96	121
WW II	Photographer	70	109	114	124
WW I B	Photographer	83	55.3	85.7	107.0
WW I F	Photographer		59	86	107
WW II	Gunsmith	53	100	112	119
WW I B	Gunsmith	57	49.0	66.0	86.1
WW I F	Gunsmith		49	66	86
WW II	Tool Maker	147	101	112	123
WW I B	Tool and Gauge Maker	71	43.3	65.7	91.0
WW I F	Tool Maker		50	67	92
WW II	Shipping Clerk	408	101	111	121
WW I B	Receiver and Shipper	360	54.0	78.1	107.9
WW I F	Clerk (Receiving and Shipping)		54	78	102
WW II	Printer	192	99	111	120
WW I B	*Not Given*				
WW I F	Printer		36	60	93
WW II	Stock Clerk	791	99	110	120
WW I B	Stockkeeper	398	55.5	77.9	104.9
WW I F	Clerk, Stock		56	80	105
WW II	Painter, Sign	96	98	110	117
WW I B	*Not Given*				
WW I F	Sign Letterer		59	81	106
WW II	Machinist	617	99	110	120
WW I B	General Machinist	1,065	39.6	62.8	88.7
WW I F	General Machinist		40	63	89

* Fryer's study does not list number of cases he used.

TABLE VIII (*Continued*)

COMPARISON OF AGCT MEDIAN AND Q VALUES FOR OCCUPATIONS IN PRESENT STUDY WITH ARMY ALPHA MEDIAN AND Q VALUES OBTAINED BY BRIDGES AND BY FRYER

	Name	*No.**	P_{25}	P_{50}	P_{75}
WW II	Policeman	172	96	109	118
WW I B	Detective and Policeman	102	45.9	69.3	90.4
WW I F	Detective and Policeman		46	69	90
WW II	Sales Clerk	2,362	95	109	119
WW I B	*Not Given*				
WW I F	Sales Clerk		38	52	96
WW II	Electrician	435	96	109	118
WW I B	General Elec.	482	56.5	80.8	108.7
WW I F	Electrician		57	81	109
WW II	Lineman, Tel. and Tel.	96	97	109	120
WW I B	Lineman	274	42.8	63.8	87.6
WW I F	Lineman		43	64	88
WW II	Telephone Operator	34		109	
WW I B	Telephone Operator	54	57.2	69.8	109.0
WW I F	Telephone Operator		46	70	95
WW II	Locomotive Fireman	106	97	108	118
WW I B	Locomotive Fireman	629	43.6	60.9	84.0
WW I F	Locomotive Fireman		44	61	84
WW II	Meat Cutter	691	94	108	117
WW I B	Butcher	370	40.4	61.4	85.1
WW I F	Butcher		40	61	85
WW II	Sheet Metal Worker	462	95	107	117
WW I B	*Not Given*				
WW I F	Sheet Metal Worker		16	22	46
WW II	Carpenter, Ship	34		107	
WW I B	Carpenter, Ship	49	49.0	69.0	95.0
WW I F	Carpenter, Ship		49	69	93
WW II	Brakeman, Railway	182	93	105	116
WW I B	Brakeman	722	41.4	63.0	86.4
WW I F	Brakeman, R.R.		41	63	86
WW II	Boilermaker	158	94	105	115
WW I B	General Boilermaker	119	31.0	51.0	74.0
WW I F	Boilermaker		31	51	74
WW II	Structural Steel Worker	107	88	104	119
WW I B	*Not Given*				
WW I F	Structural Steel Worker		20	31	62
WW II	Seaman	65	84	104	114
WW I B	*Not Given*				
WW I F	Sailor		16	32	59
WW II	Foreman, Construction	281	88	104	118
WW I B	*Not Given*				
WW I F	Foreman, Construction		62	80	114
WW II	Plumber	222	87	103	114
WW I B	Plumber	224	44.3	66.2	87.4
WW I F	Plumber		44	66	88
WW II	Automotive Mechanic	1,693	89	102	114
WW I B	Auto Engine Mechanic	166	45.1	66.4	89.0
WW I F	Auto Engine Mechanic		45	66	92
WW II	Blacksmith	162	88	102	113
WW I B	Genl. Blacksmith	173	39.0	61.1	82.4
WW I F	Genl. Blacksmith		39	61	82
WW II	Bricklayer	213	88	102	114
WW I B	Bricklayer	157	36.7	57.9	88.1
WW I F	Bricklayer		37	58	82
WW II	Carpenter, Genl.	1,004	86	101	113
WW I B	Carpenter, Genl.	657	39.7	59.8	83.7
WW I F	Carpenter, Genl.		40	60	84
WW II	Pipe Fitter	194	86	101	112
WW I B	Genl. Pipe Fitter	190	42.2	65.8	87.9
WW I F	Pipe Fitter		44	66	88

TABLE VIII (*Continued*)

COMPARISON OF AGCT MEDIAN AND Q VALUES FOR OCCUPATIONS IN PRESENT STUDY WITH ARMY ALPHA MEDIAN AND Q VALUES OBTAINED BY BRIDGES AND BY FRYER

	Name	*No.**	P_{25}	P_{50}	P_{75}
WW II	Automobile Serviceman	1,179	87	101	114
WW I B	Genl. Auto Repairman	1,142	43.2	65.1	90.6
WW I F	Auto Mechanic, Genl.		43	65	91
WW II	Rigger	44		101	
WW I B	*Not Given*				
WW I F	Rigger		33	50	75
WW II	Chauffeur	358	87	100	113
WW I B	Auto Chauffeur	2,447	42.6	64.7	91.6
WW I F	Chauffeur		43	65	91
WW II	Motorcyclist	32		100	
WW I B	Motorcyclist	195	45.7	63.4	87.8
WW I F	Motorcyclist		46	63	88
WW II	Painter, Genl.	680	83	99	113
WW I B	Painter	531	37.5	58.7	80.5
WW I F	Painter		38	59	81
WW II	Hospital Orderly	122	86	99	110
WW I B	*Not Given*				
WW I F	Hospital Attendant		19	40	67
WW II	Baker	334	83	99	113
WW I B	Baker	294	40.0	58.7	87.1
WW I F	Baker		40	59	87
WW II	Truck Driver, Heavy	3,473	83	98	111
WW I B	Heavy Truck Chauffeur	887	37.4	57.6	83.3
WW I F	Auto Truck Chauffeur		37	58	83
WW II	Horsebreaker	91	85	97	108
WW I B	Horsetrainer	221	38.5	56.6	77.4
WW I F	Horsetrainer		39	57	71
WW II	Tailor	74	82	97	112
WW I B	Tailor	143	32.0	53.3	85.7
WW I F	Tailor		42	65	89
WW II	Stonemason	43		97	
WW I B	*Not Given*				
WW I F	Mason		19	40	60
WW II	Cook	653	79	96	111
WW I B	Cook	311	40.3	59.0	82.9
WW I F	Cook		17	27	57
WW II	Stationary Fireman	107	80	95	109
WW I B	*Not Given*				
WW I F	Stationary Fireman		19	27	63
WW II	Laborer	7,805	76	93	108
WW I B	Laborer	983	28.3	46.7	68.3
WW I F	*Not Given*				
WW II	Barber	166	79	93	109
WW I B	Barber	275	33.6	54.6	77.9
WW I F	Barber		34	55	78
WW II	Shoe Repairman	118	77	93	109
WW I B	Cobbler	107	38.2	56.3	75.5
WW I F	Cobbler		38	56	76
WW II	Teamster	284	74	87	104
WW I B	Teamster	2,019	30.2	49.7	72.3
WW I F	Teamster		30	50	72
WW II	Miner	502	75	87	103
WW I B	General Miner	595	39.7	48.9	71.1
WW I F	Miner		40	49	71
WW II	Farm Worker	6,475	70	86	103
WW I B	Farmer	5,126	29.6	48.3	72.9
WW I F	Farmer		40	58	83
WW II	Lumberjack	236	70	85	100
WW I B	*Not Given*				
WW I F	Lumberman		18	35	62

pared with Survey 3 figures because no codes existed for them—*e.g.*, horse hostler, caterer, railroad shop mechanic, band musician, toolroom expert, laundryman, truckmaster, hand riveter, marine engineman, concrete construction foreman, etc.

Of the occupations studied by Fryer, data on 57 could be compared with World War II figures. Of the remainder, again, some were present in Survey 3 but were represented insufficiently for medians to have been obtained (*e.g.*, physician, dentist, construction laborer, registered nurse, etc.); the others corresponded to no code in use (*e.g.*, graphotype operator, handyman, bridge carpenter, leather worker, fisherman, etc.).

There were only 41 occupations for which relatively comparable data could be found in all three studies under comparison here. The correlation between AGCT median and Bridges Alpha median for each of these 41 occupations is .87; between AGCT median and Fryer Alpha median, .84; between Bridges median and Fryer median, .94. (Mean of the 41 AGCT medians, 105.02; sigma, 9.52. Mean of the 41 Bridges Alpha medians, 69.27; sigma, 17.80. Mean of the Fryer Alpha medians, 69.24; sigma, 19.34.)

It is readily apparent, both from the correlation of .94 and from visual inspection of TABLE VIII, that the Bridges data and the Fryer data agree very closely. For 36 of the 41 occupations compared, the Fryer values are almost identical with the original Bridges values. For 5 of the occupations, differences appear. The largest occurs for cook, which Fryer's adjustment drops from a median Alpha score of 59.0 to 27. The next largest is for accountant, which increases from 117.9 on the original to 137 on the adjusted figures. The adjustment also drops stenographer and typist from 115.0 to 103; raises tailor from 53.3 to 65; and raises farmer from 48.3 to 58.

So far as a comparison between either the Bridges or the Fryer figures and the World War II findings is concerned, TABLE VIII is difficult to interpret, since the latter are for Army General Classification Test standard scores, whereas the former are for Army Alpha raw scores.

METHODS OF COMPARISON

There are a few possible methods by which Army Alpha raw scores and AGCT standard scores may be transformed into values more comparable with each other, of which none is completely satisfactory. Three methods have been used here, and others which were considered and rejected for various reasons are also discussed briefly in order to clarify by contrast the methods actually used.

1. One could equate scores on the two tests by the method of equivalent percentiles, setting an Army Alpha raw score which falls at any given percentile in the Army Alpha distribution for a representative World War I sample equal to whichever AGCT standard score falls at that same percentile in the AGCT distribution for a representative World War II sample. Such a table of equi-percentile equivalences has been set up, based on the AGCT distribution for the 91,624 white enlisted men in Survey 2, and the World War I Alpha distribution for native white soldiers and officers given by Bingham (1, page 331). The full set of AGCT-Army Alpha equivalences obtained in this fashion is given in TABLE IX.

2. Another method would involve the use of the mean and standard deviation of the Army Alpha raw score distribution for the World War I population and the mean and standard deviation of the AGCT distribution for the World War II population to obtain scores which were equivalent in the sense that they were equally distant in sigma units from the means of the respective distributions. This would yield results very similar to the first unless either distribution were skewed, in which case the first method would be more satisfactory; therefore, no equivalences of this nature have been obtained.

3. Data are available from a study by Tuddenham soon to be published which give Army Alpha and AGCT equi-percentile equivalences based on an administration of both tests to a large sample of World War II white enlisted men. Equi-sigma equivalences could also be derived from the data given. However, neither the equi-percentile nor the equi-sigma equivalences referred to have been used in the present study. Whereas

TABLE IX

AGCT STANDARD SCORES IN WORLD WAR II EQUIVALENT TO ARMY ALPHA RAW SCORES IN WORLD WAR I, OBTAINED BY METHOD OF EQUIVALENT PERCENTILES

Based on AGCT distribution for 91,624 white enlisted men in War Department Machine Records Survey 2 and Army Alpha World War I percentiles given by Bingham (1, page 331) for white enlisted men and officers

Army Alpha Raw Score	*AGCT Standard Score*	*Percentile*
188	164	
186	162	
184	159	
182	157	
180	154	
178	152	
176	150	
174	149	
172	148	
170	146	
168	144	
166	142	
162	140	
160	139	
158	138	
156	137	
154	136	
152	136	
150	135	
148	134	
146	133	
144	132	
142	132	
140	131	
138	131	
136	130	
134	130	
132	129	
130	128	
128	128	
126	127	
124	127	90th
122	126	
120	125	
118	125	
116	124	
114	124	
112	123	
110	123	
108	122	
106	122	
104	121	
102	121	80th
100	120	
98	119	
96	118	
94	118	
92	117	
90	116	
88	116	
86	115	
84	115	70th
82	114	
80	114	
78	113	
76	112	
74	111	
72	110	
70	109	60th
68	108	
66	107	
64	106	
62	105	50th
60	104	
58	103	
56	102	
54	101	
52	100	
50	99	40th
48	98	
46	96	
44	95	
42	94	
40	92	30th
38	90	
36	88	
34	86	
32	84	20th
30	82	
28	80	
26	78	
24	76	
22	74	
20	72	10th
18	70	
16	68	
14	66	
12	63	
10	61	
8	58	
6	56	
4	51	
2	48	

the median Army Alpha raw score for the World War I population mentioned in connection with Method 1 was 61, the median Alpha raw score for the World War II sample in Tuddenham's study was 101. This tremendous difference clearly indicates that if the AGCT and Alpha values under comparison in the present study are to be put in comparable terms, this must be done on the basis of what a given Alpha score "meant" in World War I relative to what a given AGCT score "meant" in World War II, not in terms of AGCT-Alpha equivalences for a World War II sample.

4. Another method would confine itself to the data for the 41 occupations common to all three studies, and would utilize the relationship between the means and the standard deviations for the three distributions of medians for these 41 occupations to transform the Bridges and Fryer values into equi-sigma equivalent AGCT values. Such equivalences have been obtained here and are given in TABLE X, which also gives corresponding values based on Method 1, taken from TABLE IX. The major distinction between Method 1 and Method 4 lies in the fact that Method 1 equivalences are based on the *full* AGCT distribution for a very large number of World War II men and on the *full* Army Alpha distribution for a very large number of World War I men, whereas Method 4 equivalences are based only on the distributions of AGCT and Alpha medians for the 41 occupations concerned. Another difference lies in the fact that Method 1 gives equi-percentile equivalences; Method 4, equi-sigma equivalences.

TABLE X

EQUIVALENT AGCT AND ARMY ALPHA MEDIAN VALUES FOR 41 OCCUPATIONS COMMON TO WORLD WAR II, BRIDGES, AND FRYER STUDIES, OBTAINED BY VARIOUS METHODS

Name	*AGCT Median*	*AGCT Equivalents for Alpha Medians Obtained by Method 1*		*AGCT Equivalents for Alpha Medians Obtained by Method 4*		*Rank*		
		Bridges	*Fryer*	*Bridges*	*Fryer*	*WW II*	*Bridges*	*Fryer*
Accountant	129	125	131	131	138	1	1	1
Bookkeeper	122	121	121	121	120	2.5	4	4
Stenographer	122	124	121	129	121	2.5	2	3
Draftsman	120	124	124	129	127	4	3	2
General Clerk	117	118	118	119	118	5	6	5.5
File Clerk	114	118	118	119	118	6.5	5	5.5
Photographer	114	115	115	114	113	6.5	7	7
Gunsmith	112	107	107	103	103	8.5	16	16.5
Toolmaker	112	107	108	103	103	8.5	18	14
Shipping Clerk	111	113	113	110	109	10	9	10
Stock Clerk	110	113	114	110	110	11.5	10	9
Machinist	110	105	105	101	101	11.5	24	24
Policeman	109	109	109	104	104	14.5	12	12.5
Electrician	109	114	114	111	110	14.5	8	8
Lineman	109	106	106	102	102	14.5	21	22
Telephone Operator	109	109	109	105	105	14.5	11	11
Locomotive Fireman	108	104	104	100	100	17.5	27	27
Meat Cutter	108	104	104	100	100	17.5	25	27
Carpenter, Ship	107	109	109	104	104	19	13	12.5
Brakeman	105	105	105	101	101	20.5	23	24
Boilermaker	105	100	100	95	95	20.5	38	38
Plumber	103	107	107	103	103	22	15	16.5
Automotive Mechanic	102	107	107	103	103	24	14	16.5
Blacksmith	102	104	104	100	100	24	26	27
Bricklayer	102	103	103	99	99	24	32	33
Carpenter, General	101	104	104	100	100	27	28	29
Pipe Fitter	101	107	107	103	103	27	17	16.5
Automobile Serviceman	101	107	107	102	102	27	19	20
Chauffeur	100	107	107	102	102	29.5	20	20
Motorcyclist	100	105	105	101	101	29.5	22	24
Painter	99	104	104	99	99	31.5	30.5	30.5
Baker	99	104	104	99	99	31.5	30.5	30.5
Heavy Truck Driver	98	103	103	99	99	33	33	33
Horsebreaker	97	103	103	98	98	34.5	34	35
Tailor	97	101	107	96	102	34.5	37	20
Cook	96	104	79	99	83	36	29	41
Barber	93	102	102	97	97	37.5	36	37
Shoe Repairman	93	102	102	98	98	37.5	35	36
Teamster	87	99	99	95	95	39.5	39	39
Miner	87	99	99	94	94	39.5	40	40
Farm Worker	86	98	103	94	99	41	41	33

5. Another way of transforming the different kinds of data under consideration into comparable values is a ranks transformation of each of the three sets of medians. While simplest of all the methods, it is probably the one most likely to lead to serious misinterpretation, because of the loss in fineness of differentiation inevitable when data which are on the whole normally distributed are transmuted into a rectangular ranks alignment. The rank order comparison is also given in TABLE X, with the comparison based on Method 1 and that based on Method 4.

It will be seen from TABLE X that the three different bases for arriving at comparable values for the three sets of data do not always lead to the same conclusions. For example, painters, bakers, heavy truck drivers, horsebreakers, barbers, shoe repairmen, teamsters, and miners have *relative ranks* which are very similar for all three studies. But according to the Method 1 basis of comparison, these have all dropped considerably with respect to median AGCT score in World War II, indicating that the men engaged in these occupations at the present time are on the average less intelligent (in terms of the distribution of intelligence for the World War II population) than the men engaged in these occupations during the period immediately preceding the last war (in terms of the distribution of intelligence for the World War I population). According to the Method 4 comparison, painters, bakers, heavy truck drivers, and horsebreakers have approximately the same equivalent AGCT scores for all three studies, but barbers, shoe repairmen, teamsters, and miners have declined with respect to the abilities under consideration.

Policemen, according to Method 1, have the same equivalent AGCT median for all three studies; according to Method 4, their World War II median is higher than their World War I median; according to Method 5, it is lower. Other examples of disagreement in the conclusions indicated by the different methods may be cited from the data for telephone operators, ship carpenters, carpenters, brakemen, plumbers, blacksmiths, and bricklayers. These inconsistencies are not anomalies, however; they arise in consequence of the differences in kinds of data drawn upon to furnish the bases for the different comparisons and in consequence of the differences in treatment of the data used.

DIFFERENCES FOUND

On the whole, TABLE X indicates some fairly definite and consistent differences between the World War I and the World War II results. If one is willing to accept a difference upward or downward on which all three bases of comparison agree in direction, but not necessarily in magnitude, the following findings emerge:

Occupations which are higher in terms of World War II data than in terms of World War I data as given by both Bridges and Fryer are: gunsmith, toolmaker, machinist, telephone and telegraph lineman, locomotive fireman, meat cutter, boilermaker. Bookkeeper is very slightly higher.

Occupations which are lower in terms of the World War II data than in terms of the World War I data are: draftsman, file clerk, electrician, automotive mechanic, pipe fitter, auto serviceman, chauffeur, motorcyclist. Stock clerk is slightly lower.

Some of the factors underlying these differences are known; others may only be surmised. The Army population in World War II was younger (bulk of men between ages of 18 and 35, central tendency about 25) than the Army population in World War I. The median soldier in World War II had finished a year of high school; in World War I, only the sixth grade. Three years more schooling makes a greater difference in some occupations than in others. The median soldier in World War I went to work three years earlier than the median soldier in World War II, who spent the extra three years in school. Experiences during those three years of a man's life vitally affect his choice of an occupation.

A host of additional factors, some highly interrelated, some relatively independent of each other, may also be involved in the differences noted. Among these would be changes in the absolute and in the relative numbers of men employed in any given occupation; changes in the age and education distributions of men engaged in each occupation; differences in occupational requirements during the decades intervening between the two wars, owing to technological advancements; changes in degree of unionization; changes in

social status or prestige of occupations; changes in attractiveness of working conditions or in the nature of the work involved.

Other factors must be considered: changes in the age and education distributions, in the dissemination of specific kinds of information, in the general literacy, and perhaps in the distribution of intelligence in the total civilian populations from which the men in the two World Wars were drawn; differences in "intelligence" as defined operationally by Army Alpha and by AGCT (which correlate .90, but are still by no means identical); differential effects of rejection, deferment, and discharge in the two wars; differences in the manner of classifying civilian occupation in World War I and World War II; and a myriad of other factors.

One explanation that cannot be used to account for the differences noted also seems worth discussing. The original (Bridges) World War I sample and the World War II sample cannot in any sense be considered random samples from the same parent population, civilian *or* Army. The Survey 3 figures for World War II differed sufficiently from the Survey 2 figures for World War II to indicate that a repetition of the study upon still another Machine Records Survey would have yielded a slightly different occupational rank order with respect to AGCT median, owing to sampling fluctuations. But the concept of sampling fluctuations cannot be invoked to account for differences between *any* data from World War II and results obtained in World War I. The civilian population from which the soldiers were drawn in World War II was not the same as that from which soldiers were drawn in World War I; the soldiers were not selected, deferred, or rejected in the same manner or for the same causes; the rigors of training and combat differed markedly as did the reasons for separation from the Service of men initially accepted.

So many factors could be involved in the differences noted that no single one can safely be named to explain them all. The most inclusive statement that can be made as a generalization is that the direction of many of the differences found is consistent with changes in occupational requirements which have resulted from technological advancements in the decades intervening between the two World Wars.

Conclusions

This report has presented certain relationships between Army General Classification Test standard score and occupation as defined by the War Department Specification Serial Number code, based on data for white enlisted men in the War Department Machine Records Survey 3, taken June 30, 1944. The data given in Survey 3 were for 2 per cent of all Army personnel. Since officers, enlisted women, and non-white enlisted personnel were not included in the study, the population studied represented approximately 1.6 per cent of the Army.

Selective effects of deferment and rejection and the possibility of coding errors must be kept in mind in interpreting the findings.

The study yields the following conclusions:

With respect to the AGCT occupational hierarchy:

1. Consistent with previous studies, there is a clear occupational hierarchy with respect to Army General Classification Test Score.
2. Sampling errors have probably affected the position of occupations within narrow ranges of the hierarchy, but it is unlikely that a repetition of this study upon another random sample drawn from the same Army population will reveal any major shifts.
3. Occupations are not equally spaced along the hierarchy, the AGCT medians for all occupations tending toward a normal rather than a rectilinear distribution.

With respect to variability:

1. There is a substantial relationship between position in the hierarchy and AGCT variability within occupations, the lower-level occupations showing the greatest variability.
2. The restriction in variability for the upper-level occupations is primarily owing to the absence of low AGCT scores. High AGCT scores appear for the lower-level occupations.

With respect to regional differences:

1. There are consistent and frequently large differences in median AGCT score for northern and southern samples of the occupational groups.[4] All such differences which are sufficiently sizable to be statistically significant show higher medians for northern than for southern samples.

[4] See again footnote 2, Page 8.

2. The occupational hierarchy for the northern and southern samples is similar but not identical. Some of the differences may be accounted for by the unreliability of the data for the southern samples.

3. There is a slight tendency for size of difference in median to be negatively related to position of the occupation in the hierarchy.

4. The southern samples are more variable both inter- and intra-occupationally than the northern samples.

With respect to results obtained in World War I:

1. A comparison of results for 41 occupations reveals definite differences between World War I and World War II results for more than one-third of the occupations.

2. The correlation between Army Alpha median given by Bridges and AGCT median based on World War II data is .87 for these 41 occupations.

3. While it is impossible to give an unqualified explanation for the major shifts noted, the reasonableness of an explanation on grounds of changes in requirements for many of the occupations owing to technological advances has been pointed out.

With respect to counseling implications:

1. If properly interpreted, the findings of the present study can be of considerable usefulness in counseling.

2. The more restricted the range of AGCT scores for a given occupation, the more important a part does verbal and numerical ability play in that occupation. The less restricted the range, the greater the relative importance of factors other than ability of the verbal and numerical sort.

3. Approximate lower limits in terms of AGCT scores can be utilized for guidance away from some of the higher level occupations.

4. Upper AGCT limits for lower level occupations cannot be established. The range of differences among persons following any occupation is very great. As Bingham says: "When this fact is brought home to one in doubt about his choice of an occupation, it brings to a focus the important question as to whether he prefers an occupation in which he will find himself one of the more intelligent, or less intelligent, members of his calling." (1, page 58). That decision is one the individual must make for himself.

5. A test like the Army General Classification Test can, by itself, furnish no positive guidance toward any one occupation or toward any narrow zone of occupations.

6. For guidance purposes, a man's position relative to the AGCT distributions for the several occupations he is seriously considering, is likely to be of more importance than the absolute magnitude of his AGCT score.

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* Readers of Occupations may be interested in referring to "Intelligence and Occupational Adjustment," Douglas Fryer and E. S. Sparling, Occupations, 1934, XII, 10, 55–63.

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Index to Table I

Occupations Are Given in Alphabetical Order

Number in Parentheses Is the Specification Serial Number, Defined as in War Department Technical Manual 12-426

Title	*Rank*	*Title*	*Rank*
Academic High School Student (480)	70	Clerk, Dispatcher, Crew (266)	59
Accountant (268)	1	Clerk, File (355)	58
Acetylene Burner (343)	189	Clerk, General (055)	40
Acetylene Welder (257)	174	Clerk, Personnel (368)	3
Addressing-Embossing Machine Operator (105)	28	Clerk, Postal (056)	31
Aerial Photographer (001)	97	Clerk, Sales (373)	107
Aerial Photographic Technician—obs.* (003)	151	Clerk, Shipping (195)	83
Agent, Purchasing (371)	42	Clerk, Shop (457)	62
Agricultural High School Student (483)	171	Clerk, Statistical (212)	9
Aide, Engineering (170)	129	Clerk, Stock (324)	94
Airplane Electrician (295)	104	Clerk, Stock Control (374)	45
Airplane and Engine Mechanic (008)	61	Clerk, Stock Record (323)	39
Airplane Engine Mechanic (006)	126	Clerk, Traffic Rate (379)	29
Airplane Engine Service Mechanic—obs. (404)	67	Clerk-Typist (405)	30
Airplane Fabric and Dope Worker (007)	81	Combination Welder (256)	160
Animation Artist (130)	193	Commercial High School Student (481)	103
Artist (296)	63	Concrete-Mixer Operator(310)	208
Artist, Animation (130)	193	Construction Equipment Mechanic (319)	130
Athletic Instructor (283)	52	Construction Foreman (059)	164
Auditor (390)	14	Construction Machine Operator (359)	201
Automobile Body Repairman (040)	153	Cook (060)	207
Automobile Painter (143)	199	Cook's Helper (062)	100
Automobile Serviceman (316)	184	Coppersmith (061)	136
Automotive Electrician (012)	135	Crane Operator (063)	205
Automotive Mechanic (014)	172	Dental Laboratory Technician (067)	91
Automotive Parts Clerk (348)	99	Dentistry Student (066)	15
Automotive Repair Shop Foreman (337)	157	Designer, Tool—obs. (300)	26
Baker (017)	195	Diesel Mechanic (013)	142
Band Leader (020)	64	Dispatcher Clerk, Crew (266)	56
Bandsman, Cornet or Trumpet (433)	87	Dispatcher, Motor Vehicle (410)	73
Bandsman, Snare Drum (435)	144	Draftsman (070)	21
Barber (022)	219	Draftsman, Mechanical (071)	23
Blacksmith (024)	173	Dresser, Tool (026)	57
Blaster or Powderman (027)	176	Driller, Well (259)	215
Blueprinter or Photostat Operator (028)	71	Driver, Electric Truck (354)	182
Body Repairman, Automobile (040)	153	Driver, Tractor (244)	190
Boilermaker (030)	156	Electric Arc Welder (255)	166
Boilermaker, Layer-out—obs. (031)	47	Electric Motor Repairman (304)	146
Bookkeeper, General (350)	16	Electric Truck Driver (354)	182
Bookkeeping Machine Operator (351)	32	Electrical Engineering Student (223)	6
Boring Mill Operator—obs. (032)	89	Electrician (078)	108
Brake Inspector, Railway (005)	60	Electrician, Airplane (295)	104
Brakeman, Railway (033)	152	Electrician, Automotive (012)	135
Bricklayer (034)	175	Electroplater (125)	139
Burner, Acetylene (343)	189	Embalmer (079)	59
Business or Public Administration Student (336)	13	Engine Lathe Operator—obs. (101)	98
Cabinetmaker (038)	125	Engineering Aide (170)	129
Cable Splicer, Telephone and Telegraph (039)	68	Engineman, Operating (081)	163
Cameraman, Motion Picture (043)	115	Entertainer (386)	122
Car Mechanic, Railway (048)	112	Fabric and Dope Worker, Airplane (007)	81
Carpenter, General (050)	180	Farm Worker (499)	226
Carpenter, Heavy Construction (035)	72	Fighter, Fire (383)	128
Carpenter, Ship (202)	143	File Clerk (355)	58
Cashier (269)	38	Fire Fighter (383)	128
Chauffeur (344)	187	Fireman, Locomotive (111)	121
Checker, Receiving or Shipping (186)	111	Fireman, Marine (117)	216
Chemical Engineering Student (221)	10	Fireman, Stationary (084)	210
Chemical Laboratory Assistant (411)	22	Foreman, Automotive Repair Shop (337)	157
Chemist (292)	5	Foreman, Construction (059)	164
Chief Clerk (052)	17	Foreman, Labor (356)	120
Civil Engineering Student (222)	8	Foreman, Machine Shop (086)	93
Clerk, Chief (052)	17	Foreman, Warehouse (252)	86

* *Obs.*—indicates occupational codes which had become obsolete by June 30, 1944.

Title	Rank
Forging-Press Operator (087)	213
Foundryman (129)	192
Gas and Oil Man—obs. (357)	212
General Bookkeeper (350)	16
General Carpenter (050)	180
General Clerk (055)	40
General Painter (144)	191
Geologist (099)	66
Groundman, Telephone, Telegraph, or Power (299)	222
Gunsmith (011)	74
Hammersmith (025)	170
Hatch Tender—obs. (475)	117
Heat Treater (090)	127
Heavy Construction Carpenter (035)	72
Heavy Truck Driver (245)	198
High Explosives Packer (139)	132
Highway Maintenance Man (315)	183
Hoist Operator (360)	200
Horsebreaker (093)	202
Hospital Orderly (303)	194
Inspector, Meat or Dairy (120)	33
Installer-Repairman, Telephone and Telegraph (097)	54
Instructor, Athletic (283)	52
Instrument Repairman, Electrical (338)	140
Instrument Repairman, Non-electrical (098)	88
Instrumental Musician (021)	75
Investigator (301)	24
Jackhammer Operator (339)	221
Job Pressman (169)	148
Labor Foreman (356)	120
Laboratory Assistant, Chemical (411)	22
Laboratory Assistant, Physics (160)	44
Laboratory Technician, Dental (067)	91
Laboratory Technician, V-mail or Microfilm (016)	92
Laborer (590)	218
Laundry Machine Operator (103)	217
Lawyer (279)	12
Leader, Band (020)	64
Light Truck Driver (345)	209
Lineman, Power (165)	178
Lineman, Telephone and Telegraph (238)	109
Linotype Operator (106)	49
Lithographic Pressman (167)	145
Locomotive Fireman (111)	121
Longshoreman (271)	214
Lumberjack (329)	227
Machine Operator, Designated Machine (302)	169
Machine Shop Foreman (086)	93
Machinist (114)	96
Machinist's Helper (431)	119
Maintenance Man, Highway (315)	183
Maintenance Mechanic, Shop (341)	147
Manager, Production (369)	46
Manager, Store (352)	53
Manual Arts Student—obs. (396)	105
Marine Fireman (117)	216
Meat Cutter (037)	123
Meat or Dairy Inspector (120)	33
Mechanic, Airplane and Engine (008)	61
Mechanic, Airplane Engine (006)	126
Mechanic, Automotive (014)	172
Mechanic, Construction Equipment (319)	130
Mechanic, Diesel (013)	142
Mechanic, General, Railway—obs. (180)	101
Mechanic, Motorcycle (138)	55
Mechanic, Refrigeration (322)	114
Mechanic, Service, Airplane Engine—obs. (404)	67
Mechanical Draftsman (071)	23
Mechanical Engineering Student (224)	2
Mechanics Student—obs. (397)	50
Medical Student (122)	4
Millwright (127)	165
Miner (325)	225
Motion Picture Cameraman (043)	115
Motion Picture Projectionist (137)	90
Motor Vehicle Dispatcher (410)	73
Motorcycle Mechanic (138)	55
Motorcyclist (378)	188
Multilith or Multigraph Operator (128)	82
Musician, Instrumental (021)	75
Not Elsewhere Classified (010)	118
Nurse, Practical (123)	77
Office Machine Serviceman (282)	102
Operating Engineman (081)	163
Operator, Addressing-Embossing Machine (105)	28
Operator, Bookkeeping Machine (351)	32
Operator, Boring Mill—obs. (032)	89
Operator, Concrete Mixer (310)	208
Operator, Construction Machine (359)	201
Operator, Crane (063)	205
Operator, Engine Lathe—obs. (101)	98
Operator, Forging-Press (087)	213
Operator, Hoist (360)	200
Operator, Jackhammer (339)	221
Operator, Laundry Machine (103)	217
Operator, Linotype (106)	49
Operator, Machine, Designated (302)	169
Operator, Multilith or Multigraph (128)	82
Operator, Power Shovel (064)	150
Operator, Radio (177)	48
Operator, Sewing Machine (200)	197
Operator, Small Craft (314)	177
Operator, Tabulating Machine (400)	27
Operator, Telephone (309)	116
Operator, Teletype (237)	35
Operator, Woodworking-Machine (113)	186
Optician (365)	131
Orderly, Hospital (303)	194
Packer, High Explosives (139)	132
Packer, Supplies (049)	196
Packing Case Maker (203)	179
Painter, Automobile (143)	199
Painter, General (144)	191
Painter, Sign (145)	95
Parts Clerk, Automotive (348)	99
Pattern Marker, Wood (148)	134
Personnel Clerk (368)	3
Petroleum Storage Technician (485)	133
Pharmacist (149)	19
Photographer (152)	65
Photographer, Aerial (001)	97
Photographer, Portrait (155)	78
Photographic Laboratory Technician (154)	34
Photographic Technician, Aerial—obs. (003)	151
Photolithographer (107)	79
Photostat Operator or Blueprinter (028)	71
Physics Laboratory Assistant (160)	44
Pipe Fitter (162)	181
Plumber (164)	167
Pneumatic Riveter (190)	149
Policeman (291)	106
Portrait Photographer (155)	78
Postal Clerk (056)	31
Powderman or Blaster (027)	176
Power Lineman (165)	178
Power Shovel Operator (064)	150
Practical Nurse (123)	77
Pressman, Job (169)	148
Pressman, Lithographic (167)	145
Printer (168)	84
Production Manager (369)	46
Projectionist, Motion Picture (137)	90

Title	Rank
Purchasing Agent (371)	42
Radio Operator (177)	48
Radio Repairman (174)	41
Railway Brake Inspector (005)	60
Railway Brakeman (033)	152
Railway Car Mechanic (048)	112
Railway Mechanic, General—obs. (180)	101
Railway Section Hand (199)	223
Railway Switchman (233)	168
Rebuilder, Tire (240)	154
Receiving or Shipping Checker (186)	111
Refrigeration Mechanic (322)	114
Repairman, Electric Motor (304)	146
Repairman, Electrical Instrument (338)	140
Repairman, Non-electrical Instrument (098)	88
Repairman, Radio (174)	41
Repairman, Shoe (204)	220
Repairman, Utility (121)	155
Repairman, Watch (381)	110
Reporter (399)	25
Rigger (189)	185
Riveter, Pneumatic (190)	149
Rodman and Chainman, Surveying (191)	80
Sales Clerk (373)	107
Salesman (321)	51
Salvage Man (194)	158
Seaman (065)	162
Section Hand, Railway (199)	223
Serviceman, Automobile (316)	184
Serviceman, Office Machine (282)	102
Sewing Machine Operator (200)	197
Sheet Metal Worker (201)	138
Ship Carpenter (202)	143
Ship Fitter (478)	137
Shipping Clerk (195)	83
Shoe Repairman (204)	220
Shop Clerk (457)	62
Shop Maintenance Mechanic (341)	147
Sign Painter (145)	95
Small Craft Operator (314)	177
Sociology Student (395)	36
Spot Welder (334)	161
Stationary Fireman (084)	210
Statistical Clerk (212)	9
Steam Fitter (163)	141
Steel Worker, Structural (100)	159
Stenographer (213)	18
Steward (124)	85
Stock Clerk (324)	94
Stock Control Clerk (374)	45
Stock Record Clerk (323)	39
Stonemason (214)	204
Store Manager (352)	53
Structural Steel Worker (100)	159
Student, Business or Public Administration (336)	13
Student, Chemical Engineering (221)	10
Student, Civil Engineering (222)	8
Student, Dentistry (066)	15
Student, Electrical Engineering (223)	6
Student, High School, Academic (480)	70
Student, High School, Agricultural (483)	171
Student, High School, Commercial (481)	103
Student, High School, Vocational (482)	124
Student, Manual Arts—obs. (396)	105
Student, Mechanical Engineering (224)	2
Student, Mechanics—obs. (397)	50
Student, Medicine (122)	4
Student, Sociology (395)	36
Supplies Packer (049)	196
Survey and Instrument Man (228)	43
Surveying Rodman and Chainman (191)	80
Surveyor (227)	69
Switchboard Installer, Telephone and Telegraph, Dial (231)	37
Switchman, Railway (233)	168
Tabulating Machine Operator (400)	27
Tailor (234)	203
Teacher (327)	11
Teamster (235)	224
Technician, Petroleum Storage (485)	133
Technician, Photographic Laboratory (154)	34
Telephone Operator (309)	116
Telephone and Telegraph Cable Splicer (039)	68
Telephone and Telegraph Dial Switchboard Installer (231)	37
Telephone and Telegraph Installer-Repairman (097)	54
Telephone and Telegraph Lineman (238)	109
Telephone, Telegraph, or Power Groundman (299)	223
Teletype Operator (237)	35
Tender, Hatch—obs. (475)	117
Tire Rebuilder (240)	154
Tool Designer—obs. (300)	26
Tool Dresser (026)	57
Tool Maker (241)	76
Toolroom Keeper (242)	113
Tractor Driver (244)	190
Traffic Rate Clerk (379)	29
Truck Driver, Heavy (245)	198
Truck Driver, Light (345)	209
Typist—obs. (247)	20
Typist-Clerk (405)	30
Upholsterer (248)	206
Utility Repairman (121)	155
V-mail or Microfilm Laboratory Technician (016)	92
Vocational High School Student (482)	124
Warehouse Foreman (252)	86
Warehouseman (251)	211
Watch Repairman (381)	110
Welder, Acetylene (257)	174
Welder, Combination (256)	160
Welder, Electric Arc (255)	166
Welder, Spot (334)	161
Well Driller (259)	215
Wood Pattern Maker (148)	134
Woodworking-Machine Operator (113)	186
Writer (274)	7

The New U.S.E.S. General Aptitude Test Battery[1]

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THE NEW USES General Aptitude Test Battery is a combination of tests which measures a number of important aptitudes; and it supplies information regarding the individual's possibilities for successfully learning job performances in a great many occupations grouped together into fields of work.

This battery is a product of the Occupational Analysis and Industrial Services Division, which has been engaged in job and worker analysis for more than a decade. During this time a large number of batteries of tests have been developed for the prediction of success in specific occupations or small groups of related occupations. These batteries were in most instances standardized against a criterion of occupational success such as production records, and the Wherry-Doolittle Test Selection Method was employed to determine the combinations of tests having maximum validity. The batteries were devised for use in the selection process, where attention is focused upon the specific job opening and its requirements and the objective is to select the best qualified individual from the available applicants. The employment counselor, on the other hand, focuses his attention on the individual and is often interested in testing to explore the possibilities of various kinds of work for that person.

DESCRIPTION OF BATTERY

The General Aptitude Test Battery consists of 15 tests chosen as a result of factor analysis studies of a large number of tests. It measures 10 aptitudes which in varying degrees and combinations contribute to occupational success: G—intelligence, V—verbal ability, N—numerical ability, S—spatial ability, P—form perception, Q—clerical perception, A—aiming, T—motor speed, F—finger dexterity, and M—manual dexterity. Of the 15 tests, 11 are paper-and-pencil tests and 4 are apparatus tests. The entire battery requires about 2½ hours for administration.

METHOD OF STANDARDIZATION

The battery is being standardized on samples of workers employed in various occupations. Norms are being developed for groups of occupations established according to similarities in abilities. The standardization process begins with a job analysis. The purpose is to identify the job and to serve as the basis for the selection of the experimental sample. Persons are then included in the experimental sample who are performing the same kind of work, have passed the learning stage in their proficiency on the job, and are regarded as satisfactory workers by their foremen or supervisors. All such workers in a given occupation in any plant are included, whenever possible, to avoid the possibility of a biased sample resulting from the supervisor's selection of either his best or his poorest workers for testing. When the number of workers performing the same job in one plant is very large and permission cannot be obtained to test all of them, a representative sample is selected. The standardization program provides for obtaining samples of workers in each occupation from more than one locality. The entire battery is administered to each occupational sample.

OCCUPATIONAL APTITUDE PATTERNS

Norms have been developed for 20 fields of work representing approximately 2,000 occupations. These norms are expressed as Occupational Aptitude Patterns and consist of minimum aptitude scores required for occupations grouped according to the Part IV classification code structure of the *Dictionary of Occupational Titles*. Those occupations which require similar aptitudes have been grouped

[1] This paper was presented at a meeting sponsored by the Individual Appraisal Committee, NVGA Convention, Columbus, Ohio, March 30, 1947.

together into the same fields of work. The Occupational Aptitude Patterns were established after analysis of test data and job analysis schedules showed that certain occupations required a similar minimum amount of the same combination of aptitudes. Each Occupational Aptitude Pattern consists of minimum scores for only the most significant aptitudes required for the group of occupations covered by that pattern; scores on the other aptitudes measured by the Battery generally would not add materially to the predictive value of the aptitude scores for a given pattern. The minimum aptitude scores are expressed in terms of standard scores with 100 as the general population average and a sigma of 20. Each minimum score is set at 85, 100, 115, or 130 at the point which will eliminate approximately the lowest third of the standard scores of the employed sample.

Some illustrative patterns are as follows. Pattern 1 is GV—intelligence and verbal ability; the critical scores are 130 for G and 130 for V. Kinds of work which require this pattern of aptitudes are occupations in creative writing, translating, copy writing, and journalism. Pattern 2 is GN—intelligence and numerical ability, with critical scores of 130 for each. This pattern characterizes occupations in accounting and related work. Pattern 4 is GNSF with critical scores of 100 on intelligence, numerical ability, and spatial ability, and 85 on finger dexterity. Occupations covered by this pattern are those in all-round metal machining and all-round mechanical repairing. Pattern 12 is NQTF, with critical scores of 100 for numerical ability, clerical perception, and motor speed, and 85 for finger dexterity. This pattern of abilities is required for a group of occupations involving the operation of clerical machines for computational purposes. Pattern 13 is NSM with a critical score of 85 for numerical ability, spatial ability, and manual dexterity. This pattern of abilities is represented in groups of occupations involved in heavy metal structural work, in plumbing and related work, and in wood structural work.

After the General Aptitude Test Battery has been administered to a counselee, his scores are expressed as an Individual Aptitude Profile. This consists of 10 aptitude scores, each of which is obtained from one or more of the 15 tests in the battery. The score for intelligence (G), for example, is obtained from 3 tests; the verbal ability (V) score is obtained from 1 test; and the numerical ability (N) score from 2 tests. Tables have been established for converting each raw test score into a weighted standard score for an aptitude. The weights are based on the factor loadings of each test and were obtained by the Wherry-Doolittle method. Thus they represent the significance of each of the tests in measuring a given aptitude. The aptitude score is the sum of the weighted standard scores for each of the tests measuring that aptitude.

Matching Profiles With Patterns

The Individual Aptitude Profile is compared with the 20 Occupational Aptitude Patterns to determine the fields of work that are most suitable for the person's abilities. The mechanics of matching is simple. It involves the use of two cards. One shows the individual aptitude profile with the aptitude scores recorded in a row at the bottom of the card. The other card contains a row of minimum aptitude scores for each of the 20 Occupational Aptitude Patterns. The profile card is then placed on the pattern card so that the aptitude scores on the former fall just above the row of corresponding aptitude scores for Pattern 1. By inspection it is determined whether the appropriate aptitude scores made by the individual are lower than, equal to, or higher than the corresponding minimum aptitude scores for that pattern. If the individual's scores equal or surpass all scores which make up that aptitude pattern, this fact is indicated by encircling the number "1" in the box provided on the profile card. These steps are repeated by moving the profile card down one row at a time until the individual's aptitude scores have been compared with each of the 20 patterns.

This procedure avoids certain difficulties that have been recognized in the use of occupational ability patterns of a graphic type. In the usual instance, these have been constructed by charting the average standard scores made by an occupational group on a standard battery of tests. The process of

comparing an individual's graphic profile of test scores with a large number of such occupational patterns is very cumbersome. Moreover, it is very subjective. The counselor often has difficulty in deciding how similar the individual's profile should be to the average scores in the pattern and sometimes attaches too much significance to the correspondence in the *shape* of the profile and pattern regardless of discrepancies in *amounts* of abilities. The critical scores provided for the USES Battery obviate this difficulty. The graphic patterns have usually shown the scores of an occupational sample on *all* the tests of a standard battery. The counselor must then subjectively determine the relative weights or degrees of importance that should be attached to scores from the various tests. The USES patterns are comprised of critical scores on only those aptitudes which are *significant* for a particular field of work.

Use of Battery

The USES General Aptitude Test Battery has received limited use thus far in local employment offices throughout the country. Trained technicians have carefully observed the use of the battery in order to pass along information to other offices which will soon be using it. It is expected that all local offices having adequate testing facilities will be using these tests to assist them in counseling.

The use already made of the battery indicates that it is filling a real need. In the past, whenever it was found necessary to test an individual in counseling, a number of available tests were selected for administration which tapped a number of aptitudes. Since these tests were related to specific occupations, however, it was not possible to test an individual for more than 40 or 50 occupations even if two or three entire days were spent in testing. With the General Aptitude Test Battery, however, it is possible to obtain information about an individual's aptitude for several thousand occupations in a little more than two hours of testing.

This is not to imply the battery does not have limitations. One limitation is that the 10 aptitudes measured do not include such important traits as artistic aptitude, musical aptitude, eye-hand-foot coordination, etc. Many occupations require these aptitudes and dexterities, and additional tests will no doubt be added to the battery. A second limitation of the battery is that it does not cover all the jobs in American industry today. More research is necessary on the development of additional occupational aptitude patterns and on the allocation of additional occupations to the patterns already established. This research involves not only the administration of the battery to large groups of workers, but also additional analysis of jobs, as well as considerable data analysis required for establishing proper critical scores for occupations.

Even at its present stage of development, however, the battery provides useful information which has hitherto been impossible to obtain in such a short time. Because of its efficiency, we find it necessary to caution those who use it not to ignore a consideration of the individual's physical capacities, hobbies, interests, casual work experience, personal traits, education, special training, and other factors involved in determining the final choice of an appropriate vocation. The counselor must regard tests as one of the tools at his disposal. When used with other tools, it increases the chances for providing the counselee with a more accurate description of his vocational possibilities.

Dr. Dvorak has been associated with the occupational research activities of the U. S. Employment Service since the inception of the program in 1934. She collaborated in various publications concerned with this program, including Occupational Counseling Techniques and the April, 1944, issue of Occupations. *She formerly was associated with the Employment Stabilization Research Institute, University of Minnesota, where she took her doctorate in psychology.*

Scientific Management and Human Resources[1]

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It is significant that a group such as this is interested in the relationship of scientific management to human resources. It indicates a consciousness of the so-called "cultural lag" that seems to many people to be growing larger, in our country. Are we allowing technical progress to advance faster than human progress? Does scientific management, as it utilizes and contributes to technical progress, contribute to a disregard of the human element? In attempting to increase production, to make every machine and every man as useful as possible, to eliminate waste time and energy, do we restrict rather than expand the social, human side of men and women's lives, and make robots rather than men!

It will perhaps be useful to trace a little of the history of scientific management, to note the trends. Scientific management developed to meet the need of answers to several questions. It was the product of work experience, and not of an arm chair type of thinking. "How long does it take a man to do a given piece of work?" "How can obvious waste of time and energy be eliminated?" "Is it possible to plan work so that the greatest amount of quantity and quality of product will result, at the least cost in money, time, and energy?" "Can simplified work methods be evolved, through motion study, which will enable a man to do more, with greater ease?" "What will become of skill?" "How can one select and train men, so that human waste will be lessened or eliminated?"

It is obvious, as one considers these and similar questions, that, while study of materials and machines is indicated, study of human beings is also needed. As a matter of fact, the realization that the human element is the most important element in any work situation was early evident, and became more and more important as time went on. That is a distinct trend, perhaps the most evident trend, as one considers the development of scientific management.

Effects of World War I

During World War I "waste in industry" became a matter of prime importance. Scientific management men, in all areas of the field, contributed to pointing out causes of waste and outlining the remedies. Here again, while material resources were shown to be of tremendous importance, human waste was given the more important place. Techniques of discovering the waste were evolved. Everything done or planned was questioned. "Is it necessary?" and "Why?" were asked, incessantly. If the thing involved was not necessary, in part or as a whole, a method of eliminating the activity was evolved. Often it was a case of the result being necessary, but possibilities of finding less wasteful methods of achieving it were the jobs at hand. More easily available materials; more effective tools; a machine to take the place of a man; simpler skills to take the place of more complicated or less available skills—everything possible to conserve and utilize resources!

The more one studied work, in close detail, paying attention to the time and energy expended, the more the importance of the human element became evident. War has a way of saving the human element—in civilian life—to spend it in the Armed Services. The fighting men are drawn from industry, and their places taken by less usable personnel, so far as combat is concerned, by women, often by youth, and by the disabled. All this puts emphasis on the human element, as human resources are teamed with material resources, under tremendous pressure.

After World War I both the motivation and the emphasis on the elimination of waste grew less. But farsighted planners, with the possibility of another war in mind, con-

[1] An address at the meeting of the Council of Guidance and Personnel Association, Columbus, Ohio, March 28, 1947.

tinued to urge research and increasing knowledge of our resources, including human resources, and information as to where they were to be found. The profits made by industries which utilized time-and-energy saving work-methods, and the spur of competition meant that some progress was made. This progress constantly pointed up the realization that human resources are the most important of resources.

Progressive, farsighted Management helped. There was a conviction, born of actual first-hand experience, that men and women placed at work that they could do and liked to do, and helped to do it in the best and easiest way, not only could earn more money, but were better satisfied, granted, of course, that working conditions, hours, wages, etc., were properly handled. Unions helped, in so far as they stressed good working conditions, fair wages, and hours, the necessity of basing jobs on factual data and careful research. The worker himself helped, by cooperating in the elimination of fatigue; the working out of simplified work methods; the conservation and utilization of skills; and the necessity of developing these processes in the framework of a management and administration that were adequate, stable, and progressive.

World War II

With the coming of World War II, again the motivation increased, and every available management help was explored. The Armed Services had preferences, not only in matériel but also in personnel, this time including women (who volunteered) as well as men. The Armed Services also took over many of the effective people and methods of scientific management. This meant two things. The Armed Services utilized what they had, to the betterment not only of the Services, but of civilian life. Industry lost, but also gained, for methods were tried out; people were tested; results were relayed back into the civilian areas contributing to the war effort. Much experience that was accumulated but not available to industry at the time was to be made available in the post-war period. Personnel were in many cases trained to be useful through expanding opportunities; new and challenging problems were solved; case material was gathered to be later turned over for peace use. This concerned both personnel and operating people and problems.

On the other hand, the workers who carried on the jobs in the industries, both "essential" and "non-essential," were often promoted faster and farther than they could have hoped to be in peace times. New workers were recruited, placed, and trained, in industry—women, youth, the "minority groups," and the handicapped—as in World War I, but to a greater degree. New methods of conserving, utilizing, and developing the human element came into being, or were adapted or expanded.

Perhaps this can be illustrated by what happened in the field of motion study. There we have always supplemented the questions "Is it necessary?" and "Why?" with the questions "What is the job?" "Who is to do it?" "Where?" "When?" and "How?" Fortunately, during the peace years there had come a realization that things are necessary not only for tangible but for intangible reasons. We knew that not only must goods be produced because they are needed, and because men need the wages to buy the goods they need, but that people must get satisfactions in their work, and in the goods that they buy with what they receive for their labor. This implies an understanding and a consideration of the human element that comes only when one considers not only universal likenesses, but individual differences. We have found that human resources include more than physical energy, that psychological factors are also important. We have learned to supplement the findings of the so-called exact sciences with those of the social sciences.

We have learned to consider the total situation, and the twenty-four hour day. We have utilized the studies of the anthropologist, the physiologist, the psychologist, the pyschiatrist, the sociologist, and the educator.

A New Slant on Job Analysis

During these last war years we found that the available "who" made it even more necessary than it had been to know exactly "what" was to be done. We reviewed our job analyses, not only to find out the results

desired, but also the qualities of the person needed to do the job. There were increased demands to simplify the work methods, perhaps even to re-group the factors in the specific jobs, in order to utilize new, less skilled, less able or more handicapped people. There was also the necessity of trying to find more people able to do the work. This meant a more adequate screening, based on a clearer, more exact classification of jobs and their requirements, and a better understanding of people and their abilities and possibilities. It meant development of new tests and new testing methods and devices like the Orthorater, which has contributed so much to the elimination of eye fatigue. It meant the transfer of body mechanics, or bio-mechanics, from schools and colleges to plant health and safety departments and on-the-job situations. Here people were conditioned for their jobs, and unnecessary fatigue eliminated, or necessary fatigue compensated for. It meant expanded visual education, and tests to locate eye-minded people, ear-minded, etc. It meant simpler and more interesting training, like the courses developed by the Training Within Industry group, where Job Instructor Training, Job Methods Training, and Jobs Relations Training gave to every man and woman who handled others, in industry, simple, effective ways of teaching, simplifying work, and solving human relations problems. It meant attempting to develop better work methods and more capable and satisfied people, at the same time. It meant an intensive study of motivation and incentives, to get people on jobs, to help them to work hard and continuously with no ill effects, physical or psychological, to themselves. This was no easy task, through the stresses and strains of a world war.

In spite of the fact that industry had given so many people to the Armed Services, and was short of research men, teachers, personnel specialists, supervisors, etc., miracles were performed. War needs made exchanges of experience vital. Government support and finance were available, and the progress was astonishing. New groups, like counselors, entered industry, with a diversified experience that furnished at times difficult problems of adjustment, but with resources that immediately widened the scope of industrial thinking, on the human side, and with a willingness to work hard that was contagious. These women and men, for they were mostly women, often relieved over-burdened foremen and superintendents of personnel work that is an essential part of their jobs. But at the same time they furnished examples to both worker and supervisor of how such work should be done. They often served as most effective liaison, helping worker and supervisor to understand each other better, and leaving as so many did at the close of the war a new conception of human relations, "on the job."

Other Factors

The "where" during the war years furnished challenging problems to be studied. The location of the war plant, and of the place where the worker was supposed to work, rest, eat, or "recreate," the location of the worker's home, transportation problems—the complexity of the "where" is evident. Its relation to health, fatigue, and safety is also apparent. Again the total situation and the twenty-four-hour day of the worker, and often of his family and group had to be considered.

In the field of the "when," the importance of "time how long" as determining "time when" was clearly realized. Here were first-hand demonstrations of demands of the part-time, full-time, and over-time schedule. Here were the day shift, the night shift, the swing shift, working before one's eyes. Here were the needs and the ways of meeting them plainly presented. Here was a laboratory that intrigued both research man and operating man alike. Here, above all, was the living demonstration that technical problems and human problems are inseparable and concern us all, however our job may be labeled. Here were the intangibles as well as the tangibles that motivate men and women, in constant operation.

As for the "how," it became evident that incentives can postpone fatigue, but cannot eliminate it, if it is real fatigue. Physical fitness, mental alertness, emotional stability, social adjustment—jobs require these in different proportions, workers possess them to

different degrees. The "how" must consider all of these. It did. Motion Study elaborated where it needed to, simplified where it could!

What Have We Learned?

Now we come to the post-war years. The material we have accumulated must be evaluated. The problems that face us must be solved. First they must be stated, then ways in which we are going to attack them must be worked out. Industry is returning to its restricted sphere. Personnel demanded by war needs are returning to industry, either directly, or after a training period in school or college.

What have we learned? One can attempt to list only a few indications of progress:

1. Human resources have proved to be the most important resources of industry, of the Armed Services, of the country.
2. Adequately trained human beings can handle material resources more effectively than the less adequately trained.
3. The training must result not only in the needed skills to do the work required, but in appreciation of the needed satisfactions that the work should bring.
4. Skills include knowledge, dexterity, and ability to meet a changing situation.
5. Satisfaction may be intangible as well as tangible. Wages, bonuses, etc., must be supplemented by liking for the work itself, its pace, its rhythms, the method by which it is done, the companionship it offers, the prestige one acquires by doing it, etc.
6. Personnel work and operating work alike are concerned with human relations. Both may become technical, with little regard for the human element. Both have possibilities of developing better human relations.
7. Education is essential. It should prepare not only for the first job, but for all jobs. It takes place everywhere—in the home, the school, the plant. It takes place all the time, and concerns itself with the whole life of the individual, from pre-natal care to learning how to retire and how to die. It must concern itself with the resources of each of us, as a person, and as a member of a group, and with the ever-changing development and relationships that life should bring. Planned education or training has its important place, but should permeate everything that influences activity.
8. The arts of communication are the effective ways in which human relations are carried on. They can be learned, if the learner wants to use them; they can be taught if real cooperation between teacher and student is established.
9. Individual differences are important, but likenesses, are just as important. We learn to think, feel, and act together by starting with likenesses, and supplementing by the differences that individuals can contribute to group thinking.
10. Scientific management has reached the point where it is today by recognizing the importance of the human element, and can go as far and as fast as it uses all that the human sciences have to offer.

Scientific management is only one of the forces that have made contributions to such findings as these. It has helped in urging that the scientific method and objectivity be used. It has helped in urging the importance of the human element in industry, where it has not always been recognized, as well as in the other institutions of this modern world. It has helped by showing that technical progress need not be "delayed so that social progress can catch up," but that technical progress is dependent upon people, is eager to serve human progress, can be fused with human progress; that invention and all that it brings with it can free, develop, and inspire man.

By and large, scientific management is inarticulate. It *does* rather than talks, and what it says is phrased in technical language. It deals largely in practice and from that it evolves its theories or leaves them for someone else to evolve. It stands in the popular mind for "work in industry or business," although it concerns itself with activity in many other fields, with hospitals, surgery, teaching, sports, agriculture, the home. It is equally interested in problems of personnel relations and in problems of operation, including production and sales. It is often supposed to be simply a means of getting things done, although it concerns itself with getting things done with greater satisfaction to everyone concerned.

Educators can be of great service in studying, translating, and interpreting scientific management. They may find it of use in their own work. They will surely find it interesting, because part of their responsibility is to train people for jobs. They may find it a help if they need arguments as to why people require education for life, in all its aspects, including training for work. They may welcome its reenforcement of their own belief that human resources are of prime importance, requiring to be discovered, used, conserved, and developed. They may include among their responsibilities finding adequate members of their own group to work in industry itself, cooperating with those who work in schools and colleges, in order that human beings and human relations may come to be as fine and constructive as they ought to be.

Lillian M. Gilbreth needs no introduction to our readers. President of a firm of consulting management engineers, director of courses in motion study, Professor of Management, Purdue University, she has also made outstanding contributions to the literature in her field. Among her publications are "The Psychology of Management"; "Applied Motion Study" (with her husband); "The Homemaker and Her Job"; "Normal Lives for the Disabled" (with Edna Yost); "The Foreman and Manpower Management" (with Alice Rice Cook).

The Role of the American Council on Education In Student Personnel Work[1]

A. J. BRUMBAUGH

Vice-President, American Council on Education

For more than twenty years the American Council on Education has had an active interest in student personnel work. This interest is reflected in three distinct types of Council activities: interpreting and promoting student personnel work; providing instruments and techniques to be employed in student personnel work; and aiding institutions through information and consultation to develop and improve their personnel programs.

The first step in interpreting and promoting student personnel work was taken in 1926 when a newly established Committee on Personnel Methods, of which Dean Herbert E. Hawkes was Chairman, arranged for Professor L. B. Hopkins to make a survey of what a number of representative institutions were doing to assist students to develop as individuals. The Hopkins report, published in the autumn of 1926, was one of the first authoritative statements in this field. In the earlier years of its activity the Council also published a series of articles on such subjects as "College Entrance Certificates," "The Divergence in the Interpretation of Entrance Units," "Army Experiments with Progress and Proficiency Tests," "Cooperation in Personnel Work," "A United Attack on Personnel Problems," "Predicting College Achievement as a Basis for Educational Guidance," "Personnel Administration in Colleges," and "Personnel Procedure in Colleges."

As the scope of personnel services gradually expanded, the Committee on Personnel Methods, later renamed the Committee on Measurement and Guidance, focused its attention on the development of tests and records, and a second committee, the Committee on Student Personnel Work, was appointed. The latter committee has devoted its attention primarily to the preparation and publication of materials designed to interpret and promote the student personnel point of view. The following brochures, widely used by personnel officers, have been prepared under its auspices:

The Student Personnel Point of View, Series I, No. 3, June, 1937
Educational Counseling of College Students, Series VI, No. 1, April, 1939
Occupational Orientation of College Students, Series VI, No. 2, April, 1939
Social Competence and College Students, Series VI, No. 3, September, 1940
Religious Counseling of College Students, Series VI, No. 4, April, 1943
Counseling and Postwar Educational Opportunities, Series VI, No. 5, May, 1944
Student Personnel Work in the Postwar College, Series VI, No. 6, April, 1945
Financial Assistance for College Students, Series VI, No. 7, September, 1946

In addition to the brochures just noted, the following are in preparation: "Counseling for Mental Health," Brochure on the Use of Tests, Brochure on Faculty Counseling, Opportunities for Graduate Study.

The preparation of these materials requires the cooperation of many leaders in the personnel field. Conferences are held for the purpose of exploring the need for new brochures and subcommittees are appointed to prepare the materials. The preliminary draft of a brochure is circulated not only among the members of the Committee on Student Personnel Work, but among authorities on the subject dealt with in the brochure. These activities provide a valuable means for the exchange of points of view and for bringing together the best thought of leaders in the field.

[1] An address at the meeting of the Council of Guidance and Personnel Associations, Columbus, Ohio, March 28, 1947.

Other Aids

The second major contribution of the Council has been the provision of instruments and techniques to be employed in student personnel work. Since 1924 the Council has published and distributed annually the Psychological Examination prepared by Professor L. L. Thurstone. The extent to which this test is used is indicated by data for the last six months of 1946. During this period 500 colleges used the test, and 348,000 copies of both the high school and college forms were distributed. Professor Thurstone has also prepared a test of primary mental abilities, of which the Council distributed 23,000 sets during the same period.

The Cooperative Test Service, which was organized in 1930 under the direction of the Committee on Measurement and Guidance, has also prepared a large number of tests and examinations, chiefly of the objective type, for the purpose of aiding high schools and colleges in classifying students on the basis of their achievement and in evaluating the achievement of students in a wide variety of academic subjects.

Quite as important as the actual preparation and distribution of these tests has been the promotion of the idea among high schools and colleges that the measurement of educational achievement is an important phase of both secondary and higher education. That this point of view has gradually gained ground is indicated by the increase in the number of tests distributed to high schools and colleges. In 1933–1934 the total sales of tests by the Cooperative Test Service amounted to 453,470. In 1945–1946 the total sales amounted to 1,584,541. Since the beginning of its operation the Cooperative Test Service has distributed more than 14 million test booklets, and during the past fourteen years it has distributed more than 12 million answer sheets.

In response to requests from educational groups the program of the Cooperative Test Service is being extended in new directions. Among the areas in which tests have recently been developed are freshman placement, college chemistry, and the Nationwide High School Testing Program. The Nationwide High School Testing Program was initiated in January, 1946, under the direction of E. F. Lindquist of the State University of Iowa. During the first year that these tests were available, more than 143,000 copies of the Cooperative Test on Recent Social and Scientific Developments were distributed to 664 high schools in 44 states. The number of schools administering the test and the number of individuals taking it are considerably larger this year. This program is especially important because it provides secondary schools with highly comparable measures and unusually adequate norms of achievement in the area of general education which hitherto have been largely neglected, but which from the standpoint of citizenship are of great importance.

Veterans' Service

With the return of veterans to the colleges and the high schools there appeared a growing demand for an opportunity to take the General Educational Development Examinations and certain subject-matter examinations prepared under the auspices of the United States Armed Forces Institute to provide validating evidence of education gained either by informal study or through courses offered by USAFI. In response to this demand the Council organized the Veterans' Testing Service located in Chicago. During 1946, 12,554 individual veterans took one or more of these examinations under the Veterans' Testing Service, and a great many more examinations were administered in testing centers. This service is provided not only to aid veterans to secure sound credentials, but also to aid the schools, colleges, and employers in making a fair appraisal of the veteran's educational status for the purpose of classification.

Since 1939 the Council has also prepared and administered annually examinations designed to aid school administrators in the selection and classification of teachers, and to aid institutions preparing teachers to evaluate the achievement of their graduates. While less directly related to student personnel services than are most of the other tests provided by the Council, the Teacher Examinations are proving increasingly important as a means of aiding school administrators and college administrators to define the compe-

tencies which teachers should have, and to evaluate objectively the qualifications of teachers in terms of national norms.

New instruments of measurement are constantly being developed as demand arises for them. For example, there is now being developed under the auspices of the Committee on Measurement and Guidance of the Council a battery of tests in modern languages. In connection with a National Survey of Pharmacy, now in progress, tests are being constructed for the purpose of selection and classification of pharmacy students.

While there are already available some schedules and tests in the fields of personality and vocational aptitude, much remains to be done toward the development of more adequate instruments of this type. The Council is exploring this field.

This brief résumé does not present an exhaustive statement of the Council's interest or its activities in the field of tests and measurement. It does indicate, however, the importance which the Council attaches to the use of objective measures for understanding the abilities and achievements of students as a basis for giving them intelligent counsel and effective instruction.

It has long been recognized that if tests are to be used effectively and wisely they must be recorded and interpreted in an intelligible form. With this in mind the Council's Committee on Measurement and Guidance has for a number of years devoted considerable effort to the preparation of cumulative records to be used in the schools and colleges. These records are designed to give a graphic profile of the students' scores on various types of tests and examinations; to show the relation of individual scores to available norms; and to record individual growth. Because these Cumulative Records require considerable clerical service, and because many educators have not been convinced of their value, they have not been used as widely as might be desired. That their use is fairly widespread, however, is indicated by the fact that during the last six months of 1946 the Council distributed more than 30,000 college forms, and more than 14,000 high school forms.

As a further means of giving an authoritative interpretation of the techniques of test construction and of the principles underlying their use and interpretation, a volume on measurement is now being prepared under the editorship of E. F. Lindquist. The contributors to this volume are outstanding authorities in the field of measurement. While the volume will be technical in its treatment of the subject, it will nevertheless be the most up-to-date source of information to individuals who have a special interest in the construction and use of measuring instruments.

Personnel Programs Aided

Finally, the Council is endeavoring to aid institutions and organizations in developing and improving their personnel programs. In this connection I shall mention three specific projects:

A special commission of the Council on the accreditation of Service experience was organized in December, 1945, to aid institutions to deal with the special problems presented by the return of the veterans. This commission, in cooperation with educational organizations and representatives of educational institutions, has formulated policies relating to the accreditation of educational credentials presented by veterans, and the staff of the commission has held extensive conferences throughout the country for the purpose of aiding educational administrators to implement these policies. Through the work of the commission and the agencies that have cooperated with it, much of the chaos with reference to the education of veterans which existed following World War I has been avoided.

A study is now being made of the adjustment problems of disabled veterans. The purpose of this study is not so much to identify the problems as it is to aid institutions to improve their educational and counseling programs for veterans. It may be of passing interest in this connection to know that the national organization of the Disabled American Veterans has underwritten this study.

The Committee on Student Personnel Work of the Council from time to time has had under discussion the possibility of providing some type of consultation service to institutions. This matter has also been considered by the American College Personnel Association and, undoubtedly, by

other organizations. The demand for this type of service, as was indicated by repeated requests coming directly to the Council as well as to the Committee on Student Personnel Work, grew to such a degree that it was felt an experimental project might well be undertaken in this area. The Committee on Student Counseling of the Hazen Foundation, which also recognized the importance of this type of service, agreed to make available to the Council a small grant to underwrite a consultation project on student personnel work. A subcommittee of the Council's Committee on Student Personnel Work is responsible for the policies and procedures relating to this project. Because of the limited amount of the grant, the availability of the consultation service was announced to only a selected group of colleges and universities. The initial response of the institutions has been enthusuastic and fully justifies the belief that there is a widespread need for this type of service.

It is the function of the American Council on Education to attempt to aid education at all levels to fulfill its responsibility to the children in our schools and the students in our colleges. As is evidenced by this brief account of the Council's activities in student personnel work, it recognizes that one of the important services to be rendered to education is to promote continuously an interest in the individual to be educated, to provide the instruments and techniques essential to an understanding of the individual's aptitudes, abilities, and achievements, and to aid institutions in organizing and improving their student personnel services.

Ohio-born, A. J. Brumbaugh did his graduate work at the University of Chicago, where he later was Professor of Education and Dean of Students. He served on many important national and international committees and has published numerous technical studies in the field of education. He has been Vice-President of the American Council on Education since 1944.

Editorial Comment

Opening Volume XXVI

With this issue we begin Volume XXVI. We believe it to be an auspicious beginning, carrying as it does the first published report of scores made on the Army General Classification Test by Army personnel, grouped according to the occupations they followed in civilian life. In view of the practical and theoretical value attached to such data we know the vocational guidance constituency has eagerly awaited their release and we are highly gratified that we are permitted to sponsor their appearance.

We hope that Occupations may maintain this high standard during the coming year. An unusually large number of articles are accepted for publication covering a wide variety of interests. Among them are: "Value of Part-time Jobs for Maladjusted Boys," by Russell Fornwalt; "Vocational Guidance in China," by C. J. Ho; "Recent Occupational Trends," by Lester M. Pearlman; "Evaluation and Methods of Individual Appraisal," by Arthur E. Traxler; and "A Ten-Year Follow-up of Graduates of a Washington, D. C., High School," by Celia Oppenheimer.

Subscribers as well as the editors have a stake in Occupations. In order to give the former an opportunity to share in the planning of its contents, the Publications Committee of NVGA has prepared a questionnaire and check-list which will appear in the November issue. On this form, subscribers will be asked to register opinions and offer suggestions which they would like to see carried out in their Journal. We hope you will assemble your constructive ideas during the coming month so that you can fill out the questionnaire and return it promptly.

Foreign Countries Need Our Aid

In previous issues we have described the efforts which the Committee on International Relations of NVGA has made to establish relations with persons and organizations that promote vocational guidance in foreign countries. Attention was called to the requests coming from these countries for literature describing methods used in the United States.

One Branch of the Association has demonstrated how easy it is for every member to respond to this plea. At a meeting of the Southern California Branch a member of the Committee on International Relations pointed out the need and as a result received a wealth of materials—outlines of courses; materials mimeographed for class-use; record forms; blanks used in interviewing; books and pamphlets. These were promptly shipped to a correspondent in a foreign country who is thoroughly trained and will use them in upgrading counselors.

Such acts of international amity are as important as the sending of food and clothing. If each Branch would follow the example of Southern California the total result would be highly significant. If you would like to adopt the plan, address Margaret E. Bennett, Board of Education, Pasadena, Calif., Chairman of the Committee on International Relations.

Occupations Exerts Influence Internationally

This Journal has been trying to make its contribution by establishing exchanges with foreign periodicals representing vocational guidance. The present list is as follows: Revista Nacional de Cultura (Venezuela); Revista de Psicologia General y Aplicada (Spain); The Australian Management Review; Le Sourd et L' Aveugle (Belgium); The Careers Guide (South Africa); Bulletin de L'Institut National D'Etude du Travial et D'Orientation Professionnelle (France); Berufsberatung und Berufsbildung et Orientation Formation Professionnelles (Switzer-

(Please turn to page 67.)

Association Activities

Reports from Officers, Trustees, Branches, Committees, and Members of N.V.G.A.

The President's Letter

Our Association now has the largest membership in its history. Though some of our activities were curtailed or interrupted by the war there is evidence of a substantial growth in NVGA leadership on several fronts since the summer of 1945. Examples of this trend are provided by recent and current work of the Professional Training Division and of the Public Relations, Professional Membership, Publications, and Ethical Practices Committees. Other divisions and standing committees have interesting projects under way.

Occupations, *the Vocational Guidance Journal*, enters the new year with much interesting material already received for publication in its twenty-sixth volume. The *Journal* is a tower of strength and will continue to serve counselors and personnel workers in its unique way; it has no counterpart in its field.

The Association has been invited to be one of the sponsoring organizations for the White House Conference on Family Life to be held in the spring of 1948, and a representative of the Trustees will serve as a member of the Sponsoring Committee. Our contribution to this Conference will be in the fields of career planning and occupational adjustment, areas in which the factor of family life is of great significance, as all counselors well know.

Our interest in international relations, with particular reference to vocational guidance, which was stimulated last year by Margaret E. Bennett and Harry D. Kitson, is being carried forward this year under the leadership of a special committee of which Dr. Bennett is Chairman. This is a very important and timely project, one to which NVGA can make a contribution and from which we can also receive much benefit.

Owing to a feeling on the part of many of our members that the work of some of our committees is facilitated by having the chairmen serve more than one year, and also owing to the fact that the 1946–1947 committees in some cases were obliged because of effects of the war emergency to begin their work late and without the benefit of immediate past experience, you will note that some of last year's chairmen have been reappointed for this year. In other cases the chairmanship has passed to other hands according to a regular plan set up by the group itself. All the sub-divisions of the Association have very competent leadership. However, as Dr. C. Gilbert Wrenn, present Trustee and immediate past President, pointed out in Occupations, last year (November, 1946), the work of divisions and committees, through which NVGA's national influence is largely exerted, requires the participation of many of our members. We hope that all who are asked to serve in these groups will find it possible to do so.

Our 75 affiliated Branches constitute NVGA's most potent asset and greatest resource. I have already written to the officers of all of these Branches and will continue to be in touch with them throughout the year. May I take this opportunity to greet all the members of our affiliates, and the members-at-large, and ask for your continued interest and support. If you are "local" members, now is the time to join NVGA, receive your own copies of Occupations, enjoy full participation in our Conventions and other activities, and, most important of all, stimulate the growth of the counseling profession. All of the older professional groups have made their greatest gains through strong national and local organizations working as a unit. Both general and professional memberships are available at a cost which is far lower than those prevailing in other professional organizations.

Through "doing better what we are already doing," through developing new lines of activity, and through the advantages of increased membership, NVGA can go forward with the vigorous program which is needed.—WARREN K. LAYTON

News of Branches

PUERTO RICO

Ten school superintendents, 101 principals, and 169 teacher advisers in vocational guidance attended the in-service training conference held by the OIGS, reports Felix P. Cornier, Assistant Supervisor. Administration, supervision, and programs in the high schools of the Island were topics for discussion.

Certificates of Teacher Adviser in Vocational Guidance, valid for use in the Puerto Rico schools, or any private school accredited by the Insular Department of Education, have been issued. The action was mandatory by law of the Insular Legislative Assembly.

Group activities in vocational guidance in the homerooms of the junior high schools are scheduled for 30-minute periods twice a week. . . . Vocational counselors were appointed on an experimental basis last year in two vocational trade schools. The OIGS has issued a directory of practically all the public and private institutions granting scholarships and financial aid to high school students, veterans, and adults in Puerto Rico. . . . Branch meetings have had good attendance. . . . One hundred sixteen teacher advisers in vocational guidance have petitioned the Puerto Rico Teachers Association to create a Counselors Department in the Association. . . . José Gueits is director, University of Puerto Rico Counseling Center, and David Bravo is director of the center, Polytechnic Institute, San German.

MARITIME BRANCH

The Executive Committee met last spring at Truro, N. S., to plan for the annual meeting to be held in Moncton, N. B., in October. Some of the topics to be featured are: review of guidance and personnel work in the Maritime Provinces during the past year; relationship between the schools and industry; labor unions; general survey of the local economic situation.

Errata

In spite of careful checking, some errors appear in the Membership Directory, April, 1947, OCCUPATIONS. Following are the corrected listings for professional and general members:

Arenssen, Lillian, Dir., Interboro Inst., 152 W. 42 Street, New York City.
Broom, P. M., Prof. of Educ. and Psych., Franklin College, Franklin, Ind. (Brown in Directory.)
Crosby, Bertha, Couns., Pub. Schs., 5917 Vermont St., Detroit 8, (Omitted from Directory.)
Erteschick, Avram, Psych., 100 Central Park S., New York City 19.
Hanf, Martha, Couns., H. S., Belmont, Mass. (Omitted from Directory.)
Hayes, Laurence J. W., Exec. Dir., Pub. Empl. Res. Inst., 612 R St., N. W., Washington, D. C.
*Hickman, Mildred M., Dir., Guid. and Placement, Pub. Schs., 1380 E. Sixth St., Cleveland, Ohio.
Jacobs, Abraham, Jewish Voc. Serv., 308 Keith Bldg., Cincinnati, Ohio
Kinkade, Alice E., Asst. Prin., Oceanside Pub. Schs., 465 Merrick Rd., Rockville Centre, N. Y.
Long, Louis, Asst. Prof., Dir., Div. Testing and Guid., Dir. Voc. Adv. Unit, College of the City of New York, New York 31.
*Peck, Mrs. Martin W., Act. Exec. Sec., Mass. Soc. Mental Hygiene, 3 Joy Street, Boston, Mass.
Shennan, Susan E., Dir., Guid. and Place., Pub. Schs., 27 Ocean St., New Bedford, Mass.
*Smutz, Harold T., Chief, Reg. Exam. and Place. Div., Ninth U. S. Civil Serv. Region, New Federal Bldg., St. Louis 1.
Taylor, Elizabeth L., Place. Sec., Univ. Rochester, Rochester 7, N. Y.

* Professional Members.

N.V.G.A. Convention
March 29-April 1, 1948
Stevens Hotel, Chicago

Who's Who and Where

WALTER V. BINGHAM, has resigned as Chief Psychologist of the War Department. A Lieutenant Colonel in the Personnel Branch of the General Staff at the end of World War I, he was recalled in 1940 to help reorganize the Army's classification system. He was concerned with the development of the Personnel Procedures Section, the Personnel Research Section, and the Occupational Analysis Section. Since 1946 he has been Chairman of the Council Advisory to the Director of Personnel and Administration, War Department General Staff. After an extended vacation on his Maine island he will return to Washington as part-time expert consultant to the Secretary of War and Chairman of the Council Advisory to the Director of Personnel and Administration, War Department General Staff.

ROY N. ANDERSON gave two graduate courses in vocational guidance at the summer session of the University of Puerto Rico, Rio Piedras. He reported that the P. R. Branch was active and that 6,000 students were enrolled at the University. His extra-curricular activities included deep sea fishing, beach parties, and visits to the homes of sugar planters.

The following taught at summer schools: CHARLES R. FOSTER, the Pennsylvania State College; EDWARD LANDY, University of Maine; GERTRUDE FORRESTER, Boston University; KENNETH HOTCHKISS, HAROLD W. GOLDING, Albany State Teachers College; FRED KAFFER, STANLEY OSTROM, Syracuse University; RUDOLPH CORVINI, Cornell University; GOLDIE KABACK, University of Colorado, Boulder.

ELLA STEPHENS BARRETT, State Supervisor, OIGS, North Carolina, was conference leader, at the twelfth annual Student Career Conference, Alabama College, Montevallo. ROCHELLE RODD GACHET, Director of the Vocational Advisory Service at the College, directed the conference.

GEORGE W. BREWER has accepted a position as Director of Guidance, Public Schools, Cumberland, Maryland. Mr. Brewer was formerly sub-master, Milo High School, Maine, and had served as President of the Central Maine Branch, NVGA.

At the summer session of the Bucknell University Guidance Workshop the following were on the staff: DANIEL A. ROTHERMEL, Assistant Director; Consultants: MAX F. BAER, FRANK G. DAVIS, LOREN S. HADLEY, and HAROLD F. MAHONEY.

ARTHUR F. DODGE, Professor of Industrial Education, University of Illinois, was the official representative of NVGA at the installation of George D. Stoddard as President of the University, May 16, 1947.

FREDERICK GEHLMAN has been appointed Editor of the Test Department, Science Research Associates. He is completing study for his doctorate at the University of Chicago where he had been serving as assistant to L. L. Thurstone. During the war he was a Naval officer.

KENNETH ASHCRAFT has transferred from the Denver Regional Office, V. A., to become Assistant Chief, Advisement and Guidance Division, Branch Office 13.

Dean FORREST H. KIRKPATRICK of Bethany College was visiting professor at the University of Pittsburgh summer session, 1947, giving courses in personnel and labor management.

DOROTHY PORTER ISOM has gone to Honolulu, T. H., as Assistant Director, Fort Ruger Area School.

HARRY A. WANN is now Director of Division of Education and Religious Affairs, War Department, Wiesbaden, Germany.

CATHERINE D. SCHAEFER is personnel counselor, Central Michigan College of Education, Mount Pleasant, Michigan.

FREDERICK J. GAUDET, Director of the Guidance Center, Stevens Institute of Technology, Hoboken, New Jersey, has been elected President, Metropolitan (New York) Association for Applied Psychology.

FRANK FLETCHER who had been Director, Veterans Counseling Program, University of Michigan, is now Director, Opportunities Service, Ohio State University, succeeding HAROLD EDGERTON.

S. MARION JUSTICE is an Analyst, Apprentice Training Service, U. S. Department of Labor, Washington, D. C. Before his service in the U. S. Navy, he was State Supervisor, OIGS, North Carolina.

VIRGINIA LYNN, who had been on the staff of the University of Wyoming, is now Dean of Women, Nebraska State Teachers College, Wayne, Nebraska.

P. M. BROOM has been appointed Professor of Education and Psychology, Franklin College, Franklin, Indiana. He had formerly been on the staff of Howard College, Birmingham, Alabama.

HAROLD A. COOPRIDER is now Assistant Registrar, Aurora College, Illinois. He recently completed requirements for the Master of Science degree in Guidance and Personnel Work at Oregon State College, Corvallis.

EDWARD M. CARTER, formerly Counselor, Newark College of Engineering, New Jersey, is now Dean of Men, Park College, Parkville, Missouri.

ELMER C. WARREN is now an associate in the Department of Personnel, National Life Insurance Company, Montpelier, Vermont. He had been for 19 years Registrar and Director of Personnel, Colby College, Waterville, Maine. During the War he was Chief, Personal Affairs Division, AAF Personnel Distribution Command.

MARGUERITE G. VANDEVER has been appointed Director of Vocational Guidance and Placement, Occidental College, Los Angeles. She had been instructor in psychology at the college.

Maryellen Lombardi

Friends of Mrs. Maryellen Maher Lombardi will read with sorrow of her death in Los Angeles, May 28. Mrs. Lombardi had served for a number of years in the school system of Los Angeles, and at the time of her death was vice-principal of the San Pedro High School.

She had received the doctor's degree in vocational guidance at Teachers College, Columbia University, and was an active member of the Southern California Branch of NVGA.

She leaves her husband, John Lombardi, who is on the faculty of Los Angeles City College, and two children.

Major Mabel C. Murray

Friends of Major Mabel C. Murray will be distressed to hear of her death, August 29, 1947, afrer a short illness. An ardent advocate of vocational guidance, she had been a member of the New York City Branch of NVGA for nearly 20 years.

Born in Albany, N. Y., she was graduated from Hunter College. Since 1931 she had been Director of the Salvation Army Vocational Guidance and Placement Bureau, New York City. She had previously served in the Army's editorial and family welfare departments.

From a casual placement service Major Murray developed an efficient, up-to-date Vocational Guidance and Placement Bureau, which became one of the resources to which students were referred for training from various universities in New York City. Major Murray was particularly interested in the placement of persons with handicaps of age or physical disability.

Your Officers and Trustees

Informal Sketches

Warren K. Layton, President

Warren Kenneth Layton has lived in Michigan since 1919. Arriving in Ann Arbor in October of that year from military service, he took a job as Research Assistant at the University of Michigan and renewed the graduate study interrupted by World War I. During the war he served successively as civilian employee, officer in the testing and classification of recruits, and as Chief Educational Officer in General Hospital Number 19. Interested in Detroit's growing school system, Dr. Layton joined the staff of the Psychological Clinic of the Detroit Public Schools in 1920, became a counselor in 1923, and has continued in guidance work in Detroit since that time.

Born in Potomac, Illinois, of English-French-Irish-Scotch forebears, and educated at Northwestern University and the University of Illinois, Warren Layton enjoys his adopted state, though he has traveled widely and likes the whole United States. Living and working in a restless, occasionally turbulent, and never too placid community, he has found his job no dull routine, is always stimulated by Detroit's kaleidoscopic personality, confident of its future. But to diversify his experience and learn more about Detroit youth, Dr. Layton has found time to work after hours in a number of non-school activities (a motor plant, a child-care agency, a boys' club, and others).

His principal evening diversion over the years has been reading, mainly biography, history, travel, and literary criticism. Dr. Layton is an ardent motorist and enjoys week ends and vacations in his car. A more recent hobby is photography. An abiding interest is NVGA.—WARREN K. LAYTON, *Director, Division of Guidance, Detroit Public Schools.*

George S. Speer, Vice-President

Born in Oak Park, Illinois, one of five boys. Mother thought we were well behaved, neighbors disagreed. Attended the University of Wisconsin, Central YMCA College, and the University of Chicago. Schooling interrupted by my frequent desires "to see the world," which led me to wander all over this country. After marrying a Wisconsin school teacher, settled down, and have since then only wandered professionally. Two children, a daughter who looks like me and a son who looks like his mother. Hobbies: books and refinishing old furniture. Basement is piled high with things I'm "going to fix" or "might need" some time. Used to make life masks of friends, but finally had to choose between masks and friends. Kept the friends. Active in community affairs: church, Red Cross, Community Chest.—GEORGE S. SPEER, *Director, Institute for Psychological Services, Illinois Institute of Technology, Chicago.*

Edward Landy, Treasurer

Born and reared and went to school in that "Athens of America" also commonly known as the "Hub of the Universe," and also correctly pronounced as "Bawston." Although hailing from Boston I did not care for baked beans, oysters on the half shell, and would rather eat steak than lobster any day.

My undergraduate school was the Massachusetts State Teachers College, Bridgewater, and my graduate degrees were obtained at Harvard. In spite of all that, I think the rest of the country is just as good as New England, although I don't know of a better place to spend the summer.

Among my hobbies are reading, sleeping (usually two cups of coffee before retiring helps me to sleep more soundly), and trying to avoid work (not very successfully). Don't tell anyone but after twelve years of propaganda by my wife, I am beginning to like Bridge (especially now that I have found out how to play the game).—EDWARD LANDY, *Director of Guidance, Montclair High School, Montclair, N. J.*

(To be continued in an early issue)

N.V.G.A. Divisions and Committees

Reports Given at National Convention[1]

Placement and Follow-up Division

Reports from the Field on Meeting Placement Needs of Inexperienced Workers

Keen interest in good placement facilities for inexperienced workers, on the part of counselors from schools, state employment offices, veterans groups, United States Employment Service, and social agencies, was evident at the breakfast meeting held in Columbus at 7:30 A.M., March 29, 1947. The group also demonstrated a great deal of interest in experimental cooperative education and work-experience programs carried on in conjunction with vocational counseling and placement programs of secondary schools. Speakers gave reports of various types of organization that are functioning in the field at present, and lively (but too brief owing to limited time) discussion from the floor focused attention on principles involved and on practical problems.

Use of School Facilities

Sumner N. Horton, Administrative Assistant, Department of Guidance and Placement, Detroit Public Schools; Lester A. Schloerb, Director, Occupational Research Bureau, Chicago Public Schools; Florence Murphy, Assistant Supervisor, Work-Experience Section, Los Angeles Public Schools; and Thomas Ginn, Director of Vocational Guidance, Boston Public Schools, gave brief, interesting reports of placement facilities in their respective school systems.

Detroit: Mr. Horton reported that the Detroit Board of Education has provided in its Department of Guidance and Placement, a staff of nine professionally trained and experienced people supplemented with five clerical workers and full testing facilities, to give counseling, placement, and follow-up service to young men and women 16 to 21 years of age in the Detroit Metropolitan Area. This staff is located in a central placement office in the downtown area. The office is open twelve months in the year, five and a half days a week. During the twenty-five years of Detroit's experience an average of more than 60 per cent of the 140,000 youth placed were securing initial jobs and practically all needed help in making adjustments from school to business and industrial life. Under these conditions, the advantages of having general counseling, testing, and placement facilities in a single unit are outstanding.

In addition to counseling and placement service for out-of-school youth, a fine *co-operative* and *school-work* placement service for students has been developed through co-operation of the School's Central Placement office, employers, the Michigan State Employment Service, and counselors in senior high schools and vocational schools. The Detroit schools are enthusiastic over the program and believe that supplementing formal classroom instruction in technical, industrial, and commercial work is a practical means of convincing youth of the value of education and a means of keeping them in school until their courses are completed.

Chicago: Mr. Schloerb reported that in Chicago each secondary school has a full-time placement counselor responsible for counseling and placement of seniors, potential drop-outs, and of students who wish to work part time. In addition, the placement counselor issues employment certificates for students of the school who work part time or full time, and also works closely with employers who wish to consult with the schools regarding students available for employment. Other points emphasized by Mr. Schloerb include: close cooperation with the Illinois Employment Service in helping register students who desire to use this service; continuous evaluation of part-time work being done by students in order that they may gain full educational value of work without sacrificing health or progress in school; city-wide use of placement counseling forms developed through joint committee action of employers and school personnel; and a continuous occupational research program which keeps counselors and other school

[1] Continued from May Occupations.

personnel acquainted with significant occupational developments. The Central Occupational Research office continues the counseling and placement service for out-of-school youth and for students in search of work during school holidays.

Boston: Mr. Ginn reported that the Department of Vocational Guidance of the Boston Public Schools had completed thirty-five years of continuous placement service for young people dropping out or graduating from junior and senior high schools. Objectives of the service are fourfold, *i.e.*, educational guidance, vocational guidance, placement, and follow-up. Their Central Office is open twelve months in the year and has a staff of nine counselors. During the school year, part-time jobs are referred to counselors in the schools nearest to the jobs. These counselors report placements monthly to the Director of Vocational Guidance. At present, many veterans are being interviewed and counseled by staff in the Central Office regarding college entrance, on-the-job training opportunities, and trade and vocational school training.

Los Angeles: Miss Murphy reported that the Central Employment Service in Los Angeles schools has been reorganized to operate in close connection with the Work-Experience Section of senior high schools. Functions include supplementary vocational aptitude testing, job placement, field supervision of pupils asking school credit on the work-school program and development and coordination of the program among employers, schools, students, and parents. The work is carried on through *school employment coordinators* (one in each of the forty-six senior high schools) responsible for employment counseling and placement of pupils and assistance to them in acquiring maximum value from work experience; *area employment coordinators* who visit employers, counsel, and keep records of student workers on the job and assist in development of program in a given school district; and *supervisors* in the central office who are responsible for administration, testing programs, counseling, and placement of graduates not served by own school, and out-of-school students. Miss Murphy reported that at present Los Angeles Senior High School pupils on the program work for 2,000 different employers in 570 different occupations. Most of these work-experience students are more than 16 years of age; they come from all curricula and their jobs are not necessarily related to vocational education courses in school; all are working in strict accordance with child labor laws; four hours per day during the days schools are in session is the maximum working time permitted.

Use of State Employment Service Facilities

Two speakers described recent cooperative experiments conducted by local offices of the New York State Employment Service and local schools in the coordination of vocational guidance, vocational education, and placement. Evelyn Murray, New York Employment Service, New York City, described the experiment at the Central Needles Trades High School in that city. The NYSES assigned a trained placement counselor to the school to assume responsibility for placement of 4,500 day and night school pupils. The Employment Service Counselor supplemented the school's excellent guidance service with current labor market information and with a constant stream of job orders for pupil-placement. The school and Employment Service not only placed workers successfully on the basis of vocational plans and training but also assisted industry and community by eliminating duplication of effort.

Anthony Fantaci, Assistant, New York State Employment Service, Rochester, New York, reported that from February through June, 1945, the Rochester office provided job counseling and labor market information to pupils in five rural schools. An Employment Service counselor worked regularly once a week in each school, conducting group guidance and giving individual interviews. It was found that pupils in rural areas had little knowledge of job opportunities in adjacent urban centers and little realization of the occupational fields in which their abilities might be utilized. Too frequently their occupational choice was limited to establishments readily accessible to transportation

facilities or from which recruiting representatives visited the schools seeking workers.—EDITH DUFF GWINN, *Chairman, Placement and Follow-up Division.*

Occupational Research Division

Cleveland Occupational Survey—Its Present Status and Practical Application

The Cleveland Occupational Survey, reported at the breakfast meeting by Mrs. Everett H. Randall, Executive Secretary, Occupational Planning Committee, Welfare Federation of Cleveland, was a community project. The Occupational Planning Committee of Cleveland, formed in 1938 by 11 men, now includes 200 members representing business, industry, labor, and education. Nineteen groups sponsored the study and more than 1,000 individuals made specific contributions.

The study included 1,250 employers, representing 82 per cent of the gainfully employed in Cuyahoga County. Invaluable aid was given by the Ohio State Employment Service. While the actual budget was $7,000, it is estimated that, if a paid staff had accomplished the study, the cost would have been $70,000. A number of employers sent men from their staffs for training in the use of the survey questionnaire; the collection of data, as of July, 1945, was largely done by them. The Trundle Engineering Company was especially cooperative and subsidized the publication of the study, November, 1946. The Ohio State Employment Service is continuing the study and is now collecting 1946 data.

Discussion centered on the practical application of the findings. Each cooperating agency discovered practical uses for the information. Industrialists found a "pool of labor" of special value to new industries; unions used data in planning apprentice programs; counselors utilized the results as reference material; schools recognized the information as significant for curriculum construction, especially in developing courses for adult night schools; public officials felt that the data constituted a sound basis on which to plan the dovetailing of public and private employment agencies.

Other communities contemplating similar surveys were advised to cover labor market areas. Copies of the study, *Occupational Inventory of the Number and Kind of Jobs in Cuyahoga County*, are available from the Committee (cost $5.00).—ROCHELLE RODD GACHET, *Vocational Advisory Service, Alabama State College for Women, Montevallo, Alabama.*

RELATING OCCUPATIONAL OUTLOOK INFORMATION TO COUNSELING PROGRAMS

Sunday Afternoon Session

Harold Goldstein said that occupational information involves more than a collection of facts related to supply and demand of workers. Dr. Goldstein is on the staff of the Occupational Outlook Division, Bureau of Labor Statistics, U. S. Department of Labor. Data pertinent to an individual's success in an occupation should be included: method of entry, life earnings, opportunities of employment, qualifications, and training requirements.

U. S. population by 1960 will be 153 million—16 per cent more than in 1940. The proportion of older people in the population will increase. This poses the problem of allowing them to make a contribution to society after retiring age. If the long range trend continues, labor force will rise to 66 million in 1960. Assuming full employment at that time, 62½ million will be working, as compared to 45 million in 1945.

In view of increasing productivity and higher incomes for all, more money will be spent on health, welfare, and education. Greatest increase in employment will be in service occupations, paralleled by somewhat smaller increases in manufacturing and trade occupations. All major industrial and occupational groups will increase, with the exception of agriculture and possibly domestic service.

By 1960 there should be between 4½ and 5 million professional and semi-professional workers, as compared to 3⅓ million in 1940. Also, 1,400,000 teachers will be required by 1960, if the increase in population and an adequate pupil-teacher ratio are maintained. Engineering personnel has increased rapidly in the last three decades. From 1940–1945

there were more graduates in engineering than in the previous five years. Because of glamour added by war, 45,000 more students per year are taking engineering courses than had been anticipated. Because of this increase and fewer drop-outs, any "back-log" will be made up long before 1952–1953, as originally predicted. Therefore, competition in this field will be stiff and higher standards will be demanded. Pharmacists are in demand, due to no increase in numbers in the last 20 years. Social workers who can gain admission to a good training school will find ready employment on graduation. At present, the biggest increase in employment is on the semi-professional and technical levels.

There is a trend in all professional fields toward raising standards. In view of the picture of tremendous change which our society presents, the broadest possible background to ensure "occupational flexibility" was recommended. The Bureau of Labor Statistics will continue to make studies concerning the factors contributing to an individual's success in an occupation.

Richard D. Fletcher spoke on the "Application of Outlook Information to the Counseling Program." He said that the problem of securing outlook information has three aspects:

1. Securing material published by governmental and other agencies. These are easy to secure but not so easy to use.
2. Securing local information, since national is not applicable.
3. The interpretation of "fugitive" material appearing in magazines and other sources, which does not take into consideration the broad, national economic factors. Research of this nature is rather a collection of statistics than economically sound information, because relations between occupations are not considered. The conclusions reached are often dangerous. One such study, based on statistical research alone, arrived at the naive conclusion that in due time one-third of the world's population would be statisticians!

Community Occupational Surveys too often take only an "inventory" approach and draw no conclusions concerning future trends in occupations. Furthermore, interpretation of data for counseling purposes is often lacking. Types of information available from USES:

1. *Area Series:* Begun during war for use at separation centers in dealing with occupationally mobile ex-G.I.'s. Importance declining. Job opportunities in major areas of U. S. covered.
2. *Industry Series:* Bulletins begun during expansion of war industrial program. Are changed to keep pace with changes in industry.
3. *Occupational Series:* Fifteen to 20 new bulletins soon to be released. Occupations chosen for numerical significance, national interest, and "glamour." Have been prepared for specific jobs, in past, but future studies will relate to broader occupational fields.

USES material is usually detailed and technical, geared to counselor consumption and interpretation rather than to the counselee.

Counselees against whom discrimination is practiced, those with low ability, and those with high ability desiring to enter overcrowded fields, present special problems. The counselor must present pertinent local and national information and let counselee assume responsibility for making his own decision. The person with high ability, of course, has a competitive advantage in an over-crowded field.

In the general discussion of filing outlook information, the need was expressed for an adequate, simplified cross-reference method. It was pointed out that the Bureau of Labor Statistics is becoming more aware of the diversified needs of schools, industry, colleges, etc., for research material. Publications to suit the peculiar need of each are contemplated. Furthermore, the BLS is experimenting at present on the preparation of outlook information prepared for the nation as a whole, but with suggestions for local interpretation.—EDWARD P. FRIESEN, *Vice-President, Teachers College Branch, Columbia University.*

Individual Appraisal Committee

Taking Stock of Needs in Individual Appraisal

Arthur Traxler presented his paper, "Evaluation of Methods of Individual Appraisal in Counseling." In the absence of

Beatrice Dvorak, Carl A. Heinz read her paper, "The New Employment Service Test Battery." (See p. 42; Traxler's paper will appear in an early issue of OCCUPATIONS.—Ed.)

A discussion followed by members of the audience and these discussants: Clyde Coombs, AGO, War Department, Washington, D. C.; Mitchell Dreese, George Washington University, Washington, D. C., and Gordon Ellis, Iowa State Teachers College. These points were made:

1. With additional new tools for counseling, it becomes easier for poor counseling to be done by less well qualified counselors. The more tests and other aids, the more mechanical counseling may become.

2. The need was stressed for standardized methods of presenting test scores. A new scale is needed which permits direct comparison between different tests by different authors.

3. There is a great need also for some central research agency to develop tests in the broad areas of abilities, as indicated by Traxler in his paper. Such an agency would require considerable resources and time for long range research and evaluation.

4. Such a central agency should conduct research on the prognostic value of old and new tests. Test authors and graduate research students cannot be expected to conduct such intensive research.

5. Mr. Heinz stated that the USES test battery will be available to local USES offices and perhaps later to university and other research organizations.

6. It was pointed out that the probable error of a test score should be given more consideration when using and interpreting test results.

7. Dr. Dreese pointed out that the Research and Development Division of the War Department is doing extensive research in the selection of military personnel.

8. With reference to the USES test battery, it was pointed out that the test should be validated by giving the tests to persons prior to their entrance into an occupation and then given again after the worker had achieved competence in the job. This would eliminate the effect which the training might have in the validation of the test.

9. Traxler pointed out that since counselors were dealing with broad areas of adjustment, tests should be used even though the counselor might not be adequately trained to use the tests. Test results may lead the counselor to probe further and finally locate the real problem.—GORDON ELLIS, *Dean, Iowa State Teachers College.*

Preparation for Guidance Service Committee

Chairman Wendell Yeo sounded the keynote of the discussion, stating that the service can progress no further than the persons in charge of the program. Donald Super of Teachers College, Columbia University, stressed the same point in his introductory remarks when he stated, "The field of counseling at times resembles a battlefield of the professions in which the counselor is the innocent bystander caught in the crossfire of opposing forces." These forces Dr. Super identified as specialists in secondary education, deans of boys and girls, vocational teachers, social workers, and clinical psychologists.

In a frank discussion he outlined the role of the counselor, stressing the fact that the activities of counselors include helping people with adjustments of all sorts. Discussing the knowledge and skills needed by the counselor, he said, "They must have at least some orientation to the fields of remedial instruction, curriculum development, psychotherapy, social case work, vocational psychology, vocational economics, and placement work in order to increase the probability that problems may be properly identified and handled."

Since the problems are many and the scope of knowledges and skills required of the counselor are large, Dr. Super felt that before a training program for guidance personnel could be discussed, consideration must be given to the qualifications of typical individuals aspiring to do counseling, the qualifications generally required by those agencies wanting counseling services, and the amount of training a counselor can afford to obtain. In general, typical aspirants to counseling are people with some background in secondary school or college teaching, however, "in

guidance centers and consultation services, . . . two new types of counselors are emerging, one with varied, even nondescript, educational and vocational background, and one with minimal experience but with a year or two of graduate training in guidance."

The secondary schools have by tradition, set up as their qualifications for counselors that the counselor "should be familiar with educational problems from the point of view of the classroom teacher." Dr. Super feels that eventually the best qualified counselor will be selected regardless of his background of professional education, but that time is still distant. In consultation services, whether operated by colleges or by independent organizations, the tendency seems to be to seek counselors with training in psychology and experience in business and industry.

Comparing his program of training for professional counselors to the training for the profession of medicine, Dr. Super said, "The barber-technician-practitioner-specialist sequence in medecine is in reality paralleled by that of general counselor at the lowest or bachelor's level, vocational, educational or adjustment counselor at the technician's or master's level, counselor or director of guidance at the practitioner's or professional certificate level, and consulting psychologist at the specialist's or doctoral level."

The discussants, Barbara Wright and Carl Horn, substantially agreed with Dr. Super's proposals, but Miss Wright would extend the training to include workshops and in-service training. Mr. Horn disagreed with the idea that the counselor with a master's degree should be a specialist, for he felt that the counselor in any situation must cut across all kinds of problems. Mr. Horn favored cooperative-counselor training in which the counselor had extra-school work experience. He also felt that intensive study should be made of the "ten best counselors" to find "how they got that way." He also stressed the necessity for a counselor in a small school to work with teachers.

Sol Warren presented a follow-up study of persons who have received degrees in guidance from New York University since 1942. This survey was made because there is a dearth of information about the occupation of counseling itself.—HELEN SAMUEL, *Gordon Jr. H. S., Washington, D. C.;* G. EVELYN ROHR, *Baltimore, Md.*

Rehabilitation Committee

The counselor lacks adequate training and understanding of the problems of the disabled, according to Leonard Miller, Director, VA Guidance Center, Temple University. He lacks especially familiarity with medical nomenclature although medical terms appear frequently, as evidenced by a study of 1,600 recent cases. Mr. Miller stressed the need for better training facilities so that counselors may better understand the limitations of the disabled, imposed by their handicaps.

Vocational rehabilitation should begin with emphasis on vocational guidance, declared Clarence W. Failor, Chief, Rehabilitation and Education, VA Regional Office, Denver, Colorado. He pointed out that counseling the handicapped must provide the following: physical privacy in the interview, guarantee of the confidential nature of the interview, development of collateral services in close proximity to home or school, adequate follow-up, better facilities for coordination of community services, consideration of personal preference of client as to training or employment. Dr. Failor concluded that there was a lack of special facilities for unusual needs, sheltered employment, facilities for speech therapy, and for family services. One agency cannot handle all the needs.

José Gueits, Director, Veterans Guidance and Rehabilitation Center, University of Puerto Rico, discussed the special problems on the Island. The recent growth of guidance, the lack of facilities, overpopulation, the different language and cultural setting are all factors to be considered. Present functions center on occupational information, psychometrics, and counseling. Job opportunities are conditioned by the fact that one-half the workers are in agriculture, one-fourth in industry or menial work, one-fourth in service or miscellaneous trades. It is difficult to find vocational objectives in terms of actual opportunities. Of 60,000 draftees, 3.9

per cent had some college training, 59 per cent had eighth grade or less.

Donald Dabelstein of the Office of Vocational Rehabilitation, Washington, D. C., outlined the rehabilitation program, stressing the need for continuous follow-up of the client. He recommended a re-evaluation of planning and better coordination of services.—KENNETH W. HAMILTON, *Ohio State University*.

Guidance Needs of Rural Youth Today[1]

MRS. AMBER ARTHUR WARBURTON

Executive Secretary, Alliance for Guidance of Rural Youth

TRENDS IN OUR constantly shifting economy indicate that the rural youth of America will be swept along in the course of great changes in the next decade. Many factors will account for these changes, but important among these will be the increased rate of productivity in the nation's output of goods. This will greatly influence employment opportunity.

The present high volume of goods being produced may be accounted for by the increased number of people at work and the increased output per man-hour of labor.

Productivity in agriculture has lagged behind that of the industrial economy. While about 20 per cent of the population lives on farms, agricultural production represents scarcely more than 10 per cent of the total national product. But productivity is speeding up in farm operations. A recent study of agricultural employment trends in Louisiana, for example, estimates that approximately 100,000 persons will be eliminated from farm work in that state within the next few years because of the mechanization of cotton, sugar, and rice production. Throughout southern agriculture there may be from $1\frac{1}{2}$ to 2 million workers leaving the farm in the next decade.

This increased productivity will result in large migrations from rural areas. The more skilled will remain to work with the machines, while the least skilled, the least literate, will be forced to leave the land. This migration will represent the "joads" on the move, rather than the shift of the skilled workers that characterized wartime shifts in the population.

NEGLECTED AREAS

Rural areas are not equipped to prepare youth to meet the great economic and social changes they must face in the immediate future. Because of an inadequate supply of teachers, the elementary school system in the country is in a state of collapse. If rural youth cannot have an elementary education, the whole structure of education crumbles at the foundation.

School administrators of northern states are recruiting teachers from southern areas where salaries are comparatively low. For example, the schools of Portland, Oregon, recently recruited teachers in Arkansas. The School Board of Wayne County, Michigan, recruited teachers from Tennessee and Kentucky. High school opportunities for rural youth are also deficient. These are neither local nor state problems; they are of federal concern.

Health services for rural communities are also neglected. As a result, during the war a large proportion of rural youth was deferred from military service because of physical defects.

Juvenile delinquency is frequent among

[1] A report on the meeting held at Columbus, March 30, 1947. Alice M. Baldwin, Duke University, Durham, North Carolina, presided. The discussion was introduced by the following: Farm Mechanization, Migration and Rural Youth, Ewan Clague, Commissioner, Bureau of Labor Statistics, U. S. Department of Labor; Neglected Areas in Services for Rural Youth, Howard A. Dawson, Director, Rural Services, National Education Association; Rallying Community Support for Guidance Services, Ruth Strang, Professor, Teachers College, Columbia University.

rural youth. Young people must have something to do that interests them. Recreation facilities for youth in many rural areas are completely lacking. Guidance programs for farm youth in many areas are not available.

Rallying Community Support

Those interested in promoting guidance for rural youth have found certain techniques successful. Latham Hatcher, who pioneered in this field, found that by talking individually with community leaders she could gain support for guidance for rural youth. Providing means for young people to discuss their problems offers a valuable clue to ways for meeting guidance needs. Since there is a church in nearly all rural communities, church leaders should be encouraged to develop programs for youth. Persons in the community with special skills for working with youth can help in organizing guidance programs. Perhaps most important, is encouraging formation of a community council on youth problems to coordinate activities for youth.

Work in Progress

An interesting questionnaire for discovering guidance needs of out-of-school youth in rural Ohio has been developed. It provides opportunity for the individual to take an inventory of himself, his personality, and his problems.[2]

Taking a cue from Shakespeare—"All the world's a stage"—another leader of rural youth in Ohio has evolved a "Sociodrama" technique for young people, who can dramatize their problems. The adequacy of habits, skills, attitudes, and values in action are thus clarified and tested.[3]

Another fundamental development in the field of guidance is revealed in the training courses for rural teachers, at the Central Michigan College for Teachers.[4]

[2] Copies of questionnaire may be obtained from Ralph E. Bender, Department of Agricultural Education, Ohio State University.

[3] Description of Sociodrama techniques may be obtained from H. W. Harshfield, Assistant State Leader of 4-H Clubs for Agricultural Extension Service, U. S. Department of Agriculture, Columbus, Ohio.

[4] A mineographed report of these guidance courses may be obtained from Woodward Smith, Director of Extension Services, Central Michigan College of Education, Mt. Pleasant, Michigan.

Editorial Comment

(Continued from page 54)

land); Revista de la Asociacion de Maestros (San Juan, P. R.) Women's Employment (England); Sociálni Revue (Czechoslovakia).

By sending Occupations to these countries we believe we are giving them a picture of the way in which vocational guidance operates in a democratic society, and thus are contributing to the spread of democracy throughout the world.—H. D. K.

The annual National Convention of the National Vocational Guidance Association meets at the Stevens Hotel, Chicago, March 29-April 1, 1948. Begin now to budget your time and your money so that you can be there! Watch Occupations for Convention News.

Current News

Occupations . . . Techniques . . . Personalities . . . Conferences

The Syracuse Conference

ELIZABETH M. SMITH

THE TWELFTH annual conference on educational and vocational guidance was held July 24–25, 1947, at Syracuse University. It was sponsored jointly by the University, the New York State Department of Education, and the New York State Counselors' Association.

At the Thursday morning session, one section considered "The Pupil Personnel Program in the Elementary School." Ethel Kawin, Guidance officer, Glencoe, Illinois, Public Schools, discussed the Classroom Teacher, and defined guidance as "any planned contact or experience with an individual for the purpose of helping him develop in a certain direction." Helen Weston, Director of Home and School Counseling Service, Rochester, speaking on the Visiting Teacher, said that the aim of the school social worker was "the lessening of the distance between the accepted aims of education in a democracy and their attainment in practice."

In the second section of the morning session L. L. Jarvie reported on "Progress in the Technical Institute Program," sketching the development of the program from an "orange crate and a telephone" in the summer of 1946 to five technical institutes which will be operating in the state in October, 1947. Dr. Jarvie is Assistant Commissioner of Education, New York State Department of Education. A. K. Gettman, also of the State Department, described the plan to set up courses of study in the rural areas, in trade, industry, business, and agriculture.

Harold J. Dillon of the National Child Labor Committee led a panel at the afternoon session, which discussed "The Effective Pupil Personnel Program." Participants were: George E. Hutcherson, Chief, Bureau of Guidance, New York State Department of Education; Gladys L. Mersereau, Girls' Counselor, Endicott High School; Carlyle C. Ring, Superintendent of Schools, Jamestown; Howard C. Seymour, Coordinator of Child Services, Rochester; and Donald Super, Professor of Education, Teachers College, Columbia University.

The counselors have great responsibilities in trying to meet the challenge of modern living for the students in their schools, declared Harry V. Gilson in his address. Dr. Gilson is Associate Commissioner of Education, New York State Department of Education.

The dinner speaker at the Drumlins Country Club was Lyle Spencer of Science Research Associates, who was introduced by his father, Dean Spencer of the Syracuse School of Journalism. Dr. Spencer discussed "Recent Trends in Guidance."

At the Friday morning session Carl Horn, Michigan State Supervisor, OIGS, spoke on cooperation between business, industry, and education. To develop right work attitudes in youth we must have such cooperation, Dr. Horn maintains. Maurice Troyer, Professor of Education, Syracuse University, deplored our lack of a normal process of identifying and serving the geniuses in our schools.

In the afternoon session Robert Carey of Yonkers reported on vocational guidance in Chile (see OCCUPATIONS, March, 1947, p. 325); and J. Cayce Morrison, Assistant Commissioner for Research, New York State Department of Education, presented "The Study of the Status of Counseling and Gui-

dance Programs in New York State's Secondary Schools." A pilot study of 14 schools has been made and plans are underway for a study of all schools in the state.

The two-day session closed with an address on "The High School Counselor" by John Darley, Professor of Psychology, University of Minnesota. In closing Dr. Darley said: "To my mind counseling is a special example and a special case of human relations in action. In a world such as ours where physical and technological developments far exceed our skill in human relations, the vital need of the future is for the evolution and rapid development of all the sciences, all the arts, and all the clinical experiences under the general term of human relations."

A special feature of the Conference was directed tours of the Psychological Services Center, arranged by Director Milton E. Hahn. At the business meeting Fred Kaffer, Director of Guidance, Syracuse, was elected President, New York State Counselors Association.

Meetings Scheduled

Training Directors to Meet

The third annual convention of the American Society of Training Directors meets at the Hotel Book-Cadillac, Detroit, October 16–18, 1947. "Training as a Capital Investment" is the Convention theme. The Michigan Industrial Training Council will be host.

The objectives of the society are to "further the education and development of the profession of industrial training." It holds regional and national meetings, cooperates with other professional societies, with educators and representatives for business and industry. It promotes research and develops industrial training programs and procedures. Membership in the society includes a subscription to its official Journal, *The Journal of Industrial Training*, published bi-monthly.

A.V.A. Convention in Los Angeles

A series of meetings on vocational guidance is planned for the national convention of the American Vocational Association, to be held in Los Angeles, December 15 to 18, 1947. Florence Murphy, Vice-President of the Southern California Branch, NVGA, is in charge of the local committee on arrangements.

There are two members on the convention program committee representing vocational guidance: Dolph Camp and Glenn E. Smith, State Supervisors of Occupational Information and Guidance, respectively, for Arkansas and Missouri.

Outstanding Books

Outstanding educational books are selected annually by the Education Department of the Enoch Pratt Free Library, Baltimore. In the annotated list of "60 Educational Books of 1946," published in the *NEA Journal*, May, 1947, the following will be of particular interest to vocational counselors:

Guidance

Forrester, Gertrude. *Occupations;* a selected list of pamphlets. 240 pp. H. W. Wilson. $2.25. Titles annotated and arranged by occupation; directory of publishers; suggestions for filing. Valuable to counselors and teachers.

Reed, A. Y. *Occupational Placement;* its history, philosophies, procedures, and educational implications. 350 pp. Cornell Univ. Press. $3.75. A careful study, containing historical, theoretical, and practical material.

Shartle, C. L. *Occupational Information;* its development and application. 339 pp. Prentice-Hall. $4.65. How to analyze, describe, and classify jobs.

Strang, Ruth. *The Role of the Teacher in Personnel Work.* 497 pp. Columbia Univ. Teachers College. $3.25. Down-to-earth suggestions that will help teachers give better guidance. Extensively revised edition.

Psychology

Ohio State Univ. Faculty of the Univ. School. *How Children Develop;* a revision of child development study. (Univ. School series no. 3.) 79 pp. Ohio State Univ. $1.00.

Thorpe, L. P. *Child Psychology and Development*, 781 pp. Ronald. $4.50.

State Supervisors, OIGS

The State Supervisors of the Occupational Information and Guidance Service, as of August, 1947. Addresses are State Board of Education, the State capital, with the exception of those marked* and †.

Arkansas	Dolph Camp
Connecticut	Harold J. Mahoney
District of Columbia[†,1]	Mrs. Mildred Percy, Mrs. T. C. Alexander
Georgia	Rufus D. Pulliam
Hawaii	W. H. Coulter
Idaho[1]	James V. Fowler
Illinois*	C. A. Michelman
Kansas*	Marlin C. Schrader
Maine	John C. Cass
Maryland	Floyd Cromwell
Massachusetts	Joseph A. Bedard, Warren E. Benson
Mississippi	Eleanor Zeis
Missouri	Glenn E. Smith
Montana	Truman M. Cheney
Nebraska*	Frank L. Sievers
New Hampshire	Robert Dion
New Jersey	Franklin Connolly
New York[1]	George E. Hutcherson
North Carolina	Ella Stephens Barrett
North Dakota*	Bernard H. Grove
Ohio	John R. Odgers
Oregon	Glen L. Weaver
Pennsylvania	Stewart C. Hulslander
South Carolina	Harold A. Smith
South Dakota	A. A. Thompson
Utah	Fred M. Fowler
Vermont	Burton Howard Peake
Virginia[1]	Lucien D. Adams
West Virginia	Benjamin G. Kremen
Wisconsin*	John A. Kubiak
Wyoming	Raymond S. Orr

The following states have programs but no Supervisor at present: Alabama, Arizona, California, Colorado, Delaware, Indiana, Kentucky, Louisiana, Michigan, Minnesota, Ohio, Puerto Rico, Washington.

[1] Program is entirely state financed.

* State Board for Vocational Education.

† Mrs. Percy, Head, Department of Guidance and Placement, Divisions 1–9, Public Schools, Central H. S., Washington 9, D. C. Mrs. Alexander, Head, Department of Guidance and Placement, Divisions 10–13, Public Schools, 1327 S. Street, N. W. Washington 1, D. C.

Occupational Trends[1]

Employment Outlook for Business Machine Servicemen

Job prospects, training, earnings, working conditions. Bureau of Labor Statistics Bulletin No. 892. $.15. Continuation of the series of occupational studies prepared in the Occupational Outlook Division, specifically designed for vocational guidance. Analyzes the basic trends and job outlook in each of the occupations in this field, with information on training, chances for advancement, working conditions.

From the Monthly Labor Review

Postwar Labor Turnover Among Women Factory Workers

An analysis of the extent to which the wartime use of women on production jobs traditionally held by men has been carried over into the postwar period. (March, 1947, pp. 411–419.)

Labor in California and the Pacific Northwest

The entire issue of the *Monthly Labor Review* for April, 1947, is devoted to the Pacific Coast States. In a series of 10 articles, this issue answers the questions: What happened during the war? What was the effect of reconversion? What are the most likely future economic trends? Vocational guidance personnel in California, Oregon, and Washington will be especially interested in the articles on "Prospective Labor Supply," "Employment Trends," and "Economic Outlook."

Extent of Collective Bargaining and Union Recognition

The role of trade unions is of vital concern to all persons giving vocational guidance. With 15 million organized workers, the counselor will find in this article the proportion of wage earners covered by union agreements in each of the major industries in the U. S. (May, 1947, p. 765–768.)

[1] Continuing a feature begun in the April, 1947, issue of Occupations—"Occupational Trends: News Notes from the Occupational Outlook Division." Contributed by Seymour Wolfbein, Chief, Occupational Outlook Division, Bureau of Labor Statistics, U. S. Department of Labor.

Books Reviewed

Reviews of Recent Publications. . . By Various Contributors

GUIDE TO CAREER SUCCESS. By Esther Eberstadt Brooke. New York and London, Harper & Brothers, 1947. Pp. 228. $3.00.

The young man or woman starting to work, as well as the experienced worker who wishes to change his job, will profit by the advice of one who has had many years of experience as the head of a successful New York employment agency. The suggestions offered by Mrs. Brooke should be most helpful in achieving career success.

The book is divided into three parts. Part One, "Find Yourself," begins with a common-sense discussion of what testing means. Then follows a series of self-appraisal charts, "The Magnetic You," "The Intellectual You," "The Talented You," "The Physical You," and "The Temperamental You." Having determined his scores on these five charts, the reader checks his qualifications against the requirements of specific jobs in order to determine the type of job to which he is best suited.

The second part, "Find Your Job," is an analysis of right and wrong methods of applying for positions and preparing for the initial interview. The author frankly discusses the value of "pull" when rightly used, and gives some excellent suggestions about writing letters of application, preparing and answering classified ads, and the use of the employment agency and of "cold canvass."

Part Three, "Find Success," deals with the parts played by endeavor and luck in holding a job and achieving advancement, and concludes with suggestions as to times when it is wise to check up and take stock of oneself.

Written for the adult level, this book might be used with high school seniors, although the vocabulary is a little advanced. Aside from some poor proof-reading on page 15, the material is well presented and very readable. In the light of her discussion of test scores and reliability and validity, it would be interesting to know how Mrs. Brooke derived the "norms" for her tests. However, since she explains that tests that are self-administered are still experimental and that the information derived is more suggestive than conclusive, the reader may rest assured that, in Mrs. Brooke's own words, "Tests can't hurt you."—DOROTHY A. HAY, *Specialist in Guidance, New Orleans Public Schools.*

EDUCATIONAL GUIDANCE: ITS PRINCIPLES AND PRACTICE. By Ruth Strang. New York, The Macmillan Company, 1947. Pp. 268. $2.90.

The author states in the preface that this book is written with the purpose of presenting principles of guidance in dramatic form. Condensed reports of interviews constitute the central feature of the book. There are thought-provoking comments on desirable and undesirable aspects of the recorded interviews, and on the respective values of directive and non-directive approaches. The predominant emphasis is upon counseling as a "joint quest," at its best a creative process, in which technique is subordinated to sensitivity to individual needs and idiosyncrasies.

The treatment of the counseling process is preceded by four chapters in which there is an attempt to overview the nature of educational guidance, methods of self-appraisal, sources of information on training opportunities, and programs to meet educational guidance needs. Many helpful suggestions may be garnered from the perusal of these chapters, but one emerges without a comprehensive view of the "developmental program," wisely posited by the author, in which instructors and trained personnel workers cooperate to achieve their goals.

This lack is due partly to the absence of a consideration of instructional phases of guidance comparable to the detailed treatment of the interview. Learning processes involved in the development of techniques of self-appraisal and of educational planning are not clarified. The counselor invariably *imparts* information in the interviews rather

than utilizing group instruction to help students develop skill in finding and using the information they need. More emphasis upon these learning processes might have prevented the statement that "the counselor cannot make progress until the individual recognizes his need for help," and would have led to more consideration of how awareness of needs may be fostered.

There are some inconsistencies in viewpoint or vocabulary, especially in the first part of the book. For example, the term I. Q. is once described as a *region*, but it is used many times in brief descriptions as a *point*. Emphasis is placed upon the importance of multiple approaches to the study of mental ability, but too often one I. Q. occupies a prominent place in the picture of an individual. There are several excellent interpretations of scholastic aptitude in some of the interviews with students, but statements about "telling" the results of intelligence tests to students might mislead the untrained teacher as to desirable methods.

As a source book of material for the study and improvement of counseling techniques, this volume will be welcomed to extend the valuable services of the author beyond her college classes.—MARGARET E. BENNETT, *Director of Pupil Personnel, Pasadena City Schools, Pasadena, California.*

I FIND MY VOCATION. By Harry D. Kitson. New York, McGraw-Hill Book Company, Revised, 1947. Pp. 278. $1.80.

The introductory statements entitled "Preface" and "Suggestions to Teachers and Counselors" best summarize the reasons for this 1947 revised edition. They also set forth the unchanged fundamental purposes and philosophy which characterize this and the previous editions of *I Find My Vocation*.

Industrialization of areas, technological changes born of necessity, introduction of greater numbers of women in employment, resulted from exigencies of the recent war. The author also points out that many changes occur in the natural course of events as workers evolve new ways of doing things; social legislation brings needed changes in occupational conditions; additional information about occupations comes as a result of the analysis of occupations by industries, other employing units and government agencies. The government census of workers gives us the changing picture of occupational life every ten years on a national and local scale. Such changes necessitate frequent revision of books relating to a study of vocational life. To this end, references have been brought up to date, new illustrations added, exercises and projects extended, and two new chapters added.

I Find My Vocation is written in the simple, direct, clear-flowing style characteristic of the author. Most of it is in the second person which tends to make a young person feel that it is addressed to him. It is, therefore, in the nature of a manual for personal use in the study of occupations. The author warns that it is not a "compendium on occupations," rather it "stresses activity on the part of the individual," in suggesting topics for discussion, exercises, and references.

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(*Please turn to page 74*)

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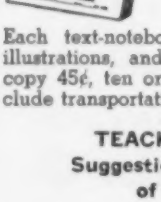

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(*Continued from page 72*)

tion to the whole, and the varied opportunities open to him.

This general approach seems to be counted valuable by the author. He states: "Vocational interests are not inborn. We acquire them in the course of experience, . . .the average person can become interested in various lines of work," and quotes as follows from the psychologist, William James: "In order to become interested in a thing, get information about it," pp. 219–220. Thus interests are broadened through wide study and a basis for eventual choices is established. To quote the author again: "Survey the field of occupations as a whole, and then select two or three for more intensive investigation," pp. 252–253.

In the section addressed to teachers and counselors, the author states that *I Find My Vocation* is designed as a high school text for classes in vocations, for civics classes, and for homeroom periods. In cases where an introductory general course such as described, has not preceded, it would seem necessary to take more time than is indicated for this background before guiding the young persons' thinking toward individual choices. Even then, the necessity for choice and rechoice as conditions change and they themselves find new interests and experiences both in and out of school, should always be kept in mind. The reviewer would like to see the following excerpts brought forward to the beginning of the study of occupations and kept in mind throughout:

> If we should designate each person for a particular vocation at the age of fourteen and expect him to remain in it for the rest of his life, we should be neglecting the fact that individuals change from time to time. By the time one had reached the age of twenty-four he might have new tastes and abilities, new experiences and knowledge. Because of this, he might be able to do the work in another vocation. Furthermore, the occupations themselves are constantly changing, and by the time the individual is twenty-four there may be entirely new occupations waiting to be filled, p. 141.
>
> We have called attention to the fact that occupations are undergoing constant modification. For this reason it is difficult to predict future opportunities and to make plans for the future. One can make only approximate plans. After studying conditions at present existing in a chosen occupation and even after entering it, one must be alert to impending changes, pp. 232–233.
>
> Every person can probably succeed in a number of vocations, p. 141.

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ideas as to the direction one's progress should take is further illustrated by the comment accompanying directions on the making of a vocational ladder:

> . . . starting from one beginning job, you may find a stage at which you could branch off into several directions, p. 122.

Caution as to too fixed ideas in seeking placement came to the reviewer's mind as she read the statement in connection with applying for a job: "I am going to make him (the employer) want me," p. 90. One of the most enlightening experiences this person ever had was when a department head advised against accepting a job he offered and frankly gave his reasons, but to show his good faith kept the position open for a generously long time.

One of the most fundamental purposes for the general study of occupations is to break down so-called social status of useful occupations and to bring about a genuine appreciation of all useful workers. This end does not seem to be served by the discussion of white-collar jobs on pages 176–177. Here is found the statement that "the druggist probably associates with 'nicer' people than does the mason." Is not this point of view exactly what we are endeavoring to correct?

Chapter VI on Studying Biographies has been extended and brought up to date. It has always been unique in the emphasis it places on the study of biography as an aid to the understanding of an occupation. To many teachers biographical study is but an incidental source of information. This chapter will open up to them many additional possibilities along this line.

Chapter IX on Appraising Your Vocational Potentialities includes an excellent discussion of the use of tests, pp. 138–142. It seems to the reviewer that some parts of the chapter need considerable help and interpretation to the student. For example, it would be very difficult for a young person to tell whether an occupation was above or below his intellectual capacity. The same difficulty is encountered in the selection of types of preparation through further education and training. As is well known, some "average" young people succeed while others more gifted may fail due to personal characteristics. The young person's over-estimate or under-estimate or his parents' hopes for him

will probably need the balance of an impartial counselor, to use this section profitably.

In conclusion we may say that the outcome of an intensive study of occupations is generally recognized to be not so much a present choice and plan as the fact that such a tentative plan leads to further study and readjustment of plans. For this, the technique of investigation, knowledge of dependable sources of information, precautions against false information and counsel, may be counted as valuable results of the properly guided study of occupations. Thus should come to pass the author's hope that this study will continue through life as the individual makes his successive adjustments to occupational life. To quote again:

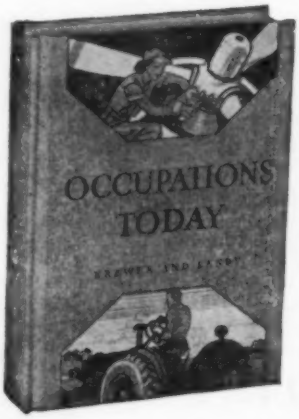
> . . . one must be a constant student of his occupation, must keep up with the times, watch new developments, and adapt himself before the changes occur.
>
> . . . one never completes his training. In the first place, one can never learn all there is to know about his vocation. In the second place, the vocation changes from time to time. New discoveries are being made and new inventions arise that modify it. To keep abreast of the times, one must study constantly, p. 172.

Finally may the reviewer add her hope that whatever else an individual gains from this study or whatever work his hand may finally find to do, his own dignity and his respect for others may be enhanced by his realization for himself and others, that for each, his vocation is "his unique way of serving society," p. 5.—MILDRED LINCOLN BILLINGS, *Rochester, New York.*

"WANT A JOB? OR A BETTER JOB?" By Ingram See. New York, The Ronald Press Company, 1947. Pp. v–118. $2.00.

This book has been written from the author's practical experience. The terminology used is short and terse. Mr. See has organized the presentation of steps and suggestions for employment counseling from the employment manager's point of view. It is similar in content to Edlund's book, and not nearly so comprehensive as Abraham's. No attempt has been made to set forth a series of rules or guiding principles for the professional counselor to use in advising job seekers. However, each professionally trained vocational counselor can benefit from the few hours it takes to read this book. Each job hunter will learn much to aid him in obtaining employment. Those seeking advancement will find help or an understanding

(*Please turn to page 78*)



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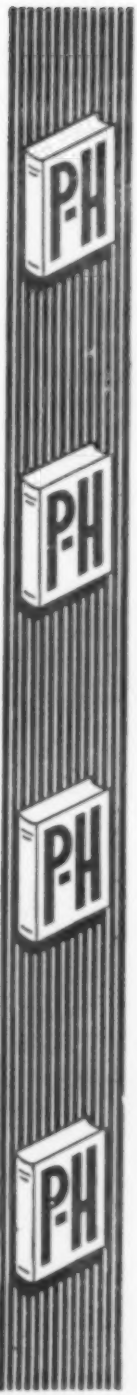

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(*Continued from page 76*)

why they do not receive promotions. The material is more applicable to individuals seeking jobs in the professional, managerial, clerical, and sales occupational fields.

Apt quotations from employment managers emphasize the points of each chapter. The chapter titles are: Use Your Head to Get Ahead; A Right Attitude Is Your Greatest Asset; Look for Your Hidden Abilities; Can You Profit by Further Study?; Where to Turn for Help and Guidance; How to Obtain Interviews; A Written Application Can Work Wonders; Acquiring Self-Confidence; Your Appearance Is What You Make It; You Stand or Fall at the Interview; Take a Job—And Seriously; How to Go After a Government Job; Postscript for Veterans; To the Ladies—God Bless 'Em!; Summary; and Index.

No mention is made of methods or aids for selecting an occupational objective or the use of employment trend data. The second chapter lists and illustrates background materials commonly included in a good individual survey form. In the third chapter, "Where to Look for Help and Guidance," the term "Guidance" is loosely used. It will be reassuring to members of the profession to note that the author does not recommend fee-charging employment agencies generally. No reference is made to community guidance clinics. The author has not recommended vocational counseling and testing as part of the evaluative process.

The book is easy to read and holds the interest. Further, it will be a distinct help to the intelligent job seeker who applies his own originality to the methods outlined. If every job seeker followed the pattern outlined it would soon force employment managers to use more scientific methods for selection.—KEN ASHCRAFT, *Asst. Chief, Advisement and Guidance Division, V. A. Branch Office 13, Denver.*

Publications Received

Employment Opportunities in Aviation Occupations. Part II. Bureau of Labor Statistics, U. S. Department of Labor, 1947. Bulletin No. 837-2. Superintendent of Docu-

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Duties, qualifications, hours, earnings, occupational hazards, etc. Covers flight and ground personnel. A straightforward presentation which says frankly that there will be a surplus of qualified applicants in the next few years and that competition for jobs will be stiff.

Employment Outlook in Foundry Occupations. Bureau of Labor Statistics, U. S. Department of Labor, 1946. Bulletin No. 880. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., Pp. 56. $.15.

Job descriptions, qualifications, training, earnings, etc.

Career Opportunities in Aviation. A Handbook of Vocational Information. National Council of Technical Schools, 837 17th Street, N. W. Washington, D. C. Pp. 31. Paper. $.15.

Intended as a source of information for persons interested in vocational opportunities in the field. No specific statement of earnings is given. This booklet, unlike government publications on opportunities in aviation, does not caution the aspirant that for the next few years there will be more applicants than jobs available and that competition will be stiff.

Occupational Data for Counselors. A Handbook of Census Information Selected for Use in Guidance. Bulletin 817. Bureau of Labor Statistics, U. S. Department of Labor, 1945. U. S. Government Printing Office. Pp. 36. $.10.

Very valuable for the counselor. Includes summaries of occupational data and suggestions for interpreting data.

Educational and Employment Opportunities for Youth. Report and Recommendations of the Interagency Committee on Youth Employment and Education to the Director of War Mobilization and Reconversion. Children's Bureau Publication No. 319. Washington, D. C., Federal Security Agency, U. S. Children's Bureau, 1947. Pp. 30. Free.

States the difficulties of peacetime adjustment for youth and gives conclusions and recommendations. Note particularly the statement on principles of placement service for youth, p. 24.

Hoppock, Robert, Compiler. *Best Books of 1946 on Vocational Guidance.* Occupational Index, New York University, Washington Square, New York, 1947. Pp. 6. $.25.

A list of 18 books which, in the opinion of the compiler, were the best books in vocational guidance for the year. Books dealing primarily with vocational information are not included.

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